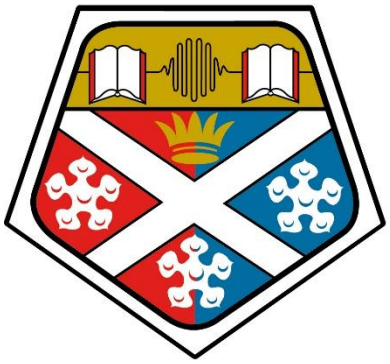

University of Strathclyde Glasgow

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Beyond Survival: Crisis Management Capability Development and Organisational Enhancement in High-Growth Scottish SMEs

By

Daria Samatoina

A thesis presented in fulfilment of the requirements for the degree of Doctorate in Education

2025

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Acknowledgements

Completing this doctoral journey and crafting this thesis has been a very challenging but rewarding experience, and it is with gratitude that I acknowledge the support, guidance, and contributions that have accompanied me along this path.

First and foremost, I thank my supervisors, ***Dr Russell Matthews*** and ***Dr Lucrezia Casulli***. Your supervision, scholarly insights, and patience have been instrumental in shaping this research into its final form. Thank you for believing and not giving up.

My appreciation goes to the ***participants*** of this study, whose contributions formed the foundation of this research. Their willingness to share their experiences and insights has been pivotal in uncovering the dynamics of SMEs' decision-making, sense-making, and resilience during times of extreme uncertainty.

I would like to express to deepest gratitude to ***Professor Sarah Dodd*** and ***Associate Professor Deema Refai*** for providing considerable guidance to improve my thesis and granting me the opportunity to do better. Your scholarly expertise, constructive feedback, and commitment to academic excellence have been instrumental in shaping this final thesis and my development as a researcher.

I would like to extend my gratitude to the Strathclyde Business School Hunter Centre for Entrepreneurship for your continuous support and encouragement. Thank you for giving me this opportunity to complete my thesis.

Lastly, I thank my family for their endless support, patience, and encouragement. I dedicate this work to my father.

I am beyond grateful to all of you.

Abstract

This research investigates how high-growth potential Scottish small and medium-sized enterprises (SMEs) develop crisis management capabilities that enable organisational enhancement beyond pre-crisis potential during extreme uncertainty conditions. Through longitudinal case study methodology spanning March 2020 to March 2021, the investigation examines six high-growth SMEs as they navigated the COVID-19 pandemic, providing unique real-time analysis of organisational development during actual crisis conditions.

The study addresses critical gaps in crisis management literature, which has predominantly focused on large organisations whilst emphasising survival and recovery paradigms that may inadequately capture SME-specific capabilities and transformation possibilities. Drawing on crisis management, sense-making, strategic adaptation, resource innovation, resilience, and antifragility theories, the research employs purely inductive qualitative methodology to generate theoretical understanding from empirical observations.

The study's central contribution is the *Crisis Management Capability Development Model* - a comprehensive framework explaining how sustained crisis exposure enables progressive capability enhancement through five interconnected mechanisms operating simultaneously across temporal crisis phases. This model demonstrates that crisis management effectiveness emerges through accumulated learning rather than formal planning, whilst revealing how SME structural characteristics create distinctive advantages for uncertainty navigation that may exceed large organisation capabilities.

Methodologically, the research establishes precedents for crisis-concurrent data collection approaches that capture developmental processes in real-time rather than relying on retrospective reconstruction. The COVID-19 pandemic provided unique natural experiment conditions enabling comparative analysis across diverse organisational contexts.

The findings have practical implications for SME practitioners, demonstrating that crisis management capabilities develop through sustained practice and iterative learning rather than comprehensive planning or resource accumulation. The study moves beyond crisis management thinking from defensive frameworks emphasising survival toward transformational approaches recognising extreme uncertainty as catalyst for organisational enhancement. The investigation demonstrates that crisis conditions, when effectively navigated through systematic capability development can serve as transformational opportunities enabling lasting strategic advantages extending well beyond immediate crisis resolution.

Keywords: *Crisis management, antifragility, SMEs, organisational resilience, capability development, sense-making, strategic adaptation, resource innovation, temporal learning, values-based management, COVID-19, longitudinal case study.*

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Chapter one: Introduction

Research Background and Context

The global business environment has become increasingly characterised by volatility, uncertainty, complexity, and ambiguity, fundamentally challenging traditional approaches to organisational management and strategic planning (Bennett & Lemoine, 2014; Schoemaker et al., 2018). This transformation has been particularly pronounced following the emergence of the COVID-19 pandemic in early 2020, which represents arguably the most significant global crisis in recent history, fundamentally disrupting established business models, supply chains, and market dynamics across virtually all economic sectors (Pedauga et al., 2022; Kuckertz et al., 2020). The pandemic has created a unique natural experiment for understanding how organisations navigate extreme uncertainty whilst developing capabilities that enable not merely survival, but potential enhancement through adversity exposure.

Small and medium-sized enterprises (SMEs), which constitute the economic backbone of developed economies, face distinctive challenges during crisis conditions that differentiate them substantially from larger organisational contexts. In Scotland specifically, SMEs represent over 99.3% of all private sector businesses and employ approximately 1.2 million people, contributing £56 billion to the Scottish economy and making their crisis management capabilities fundamental to regional economic resilience and recovery (Scottish Government, 2021). However, the predominant focus in crisis management literature on large corporations has created theoretical frameworks that may inadequately address the unique characteristics, capabilities, and constraints that define SME operating environments (Herbane, 2010; Doern et al., 2019).

Furthermore, Scotland's institutional landscape provides sophisticated support systems for high-growth potential SMEs through organisations such as Highlands and Islands Enterprise (HIE), Scottish Enterprise, and various regional development agencies. These institutions offer professional development programmes, funding opportunities, strategic guidance, and collaborative networks that create unique conditions for investigating how enterprises with growth ambitions navigate crisis conditions (Huggins & Williams, 2011; Brown & Mason, 2017). This institutional context enables examination of collaborative crisis management and

ecosystem-level resilience that extends beyond individual organisational responses to encompass broader economic and social dimensions.

The prevailing paradigm in crisis management scholarship emphasises damage control, risk mitigation, and restoration to pre-crisis states through defensive strategies primarily focused on survival and recovery (Pearson & Clair, 1998; Coombs, 2007). This approach, whilst valuable for understanding immediate crisis response mechanisms, may inadequately capture the full spectrum of organisational responses to extreme uncertainty, particularly those that transcend simple adaptation to achieve genuine transformation. Emerging evidence suggests that certain organisations not only survive crisis conditions but emerge stronger, more capable, and better positioned for future challenges, where this is a phenomenon that existing theoretical frameworks struggle to explain comprehensively (Linnenluecke, 2017; Williams et al., 2017).

The concept of antifragility, introduced by Taleb (2012), proposes that certain systems benefit from stress and volatility, becoming stronger through adverse exposure rather than simply resisting or recovering from disruption. Unlike resilient systems that maintain stability or fragile systems that break under pressure, antifragile systems utilise stress as information and energy sources for enhancement. While this concept has gained considerable attention across various disciplines, its application to organisational crisis management, particularly within SME contexts, remains largely theoretical and empirically underexplored (Ramezani & Camarinha-Matos, 2020; Taleb, 2012).

The intersection of crisis management theory, SME characteristics, antifragile development, and institutional support systems represents a significant theoretical and practical gap in current understanding. Traditional crisis management approaches, developed primarily for large organisations with substantial resources and formal structures, may be insufficiently nuanced to capture the distinctive ways SMEs navigate uncertainty (Runyan, 2006; Spillan & Hough, 2003). Similarly, resource-based theories may underestimate how constraint-driven innovation and creative resource utilisation can create competitive advantages that emerge specifically through limitation rather than abundance (Baker & Nelson, 2005; Senyard et al., 2014).

Problem Statement and Research Rationale

Recent research in crisis management literature exhibits several fundamental limitations that constrain both theoretical understanding and practical application, particularly regarding SME contexts. The predominant focus on large organisations has created theoretical frameworks emphasising formal planning processes, comprehensive risk assessment procedures, and bureaucratic response mechanisms that may not align with SME realities characterised by informal decision-making structures, resource limitations, and rapid adaptation capabilities (Herbane, 2010; Spillan & Hough, 2003). The assumption underlying much crisis management theory is that organisations possess substantial resources, professional management structures, and formal planning capabilities, where this may systematically misrepresent SME operating conditions whilst underestimating unique capabilities that smaller enterprises may possess for uncertainty navigation.

The temporal dimension of crisis management remains poorly understood within existing literature, with the majority of research employing cross-sectional designs that capture snapshots of organisational responses rather than developmental processes through which crisis management capabilities evolve over extended periods (Bundy et al., 2017; Boin et al., 2005). This methodological limitation systematically underestimates the learning and adaptation processes that enable sustained effectiveness during uncertainty periods, missing crucial insights about how organisations develop sophistication in uncertainty navigation through accumulated experience and iterative capability refinement. The emphasis on discrete crisis events rather than extended uncertainty conditions further limits understanding of how organisations integrate crisis learning into enhanced strategic capabilities.

Furthermore, the survival-oriented paradigm that dominates crisis management thinking may inadequately capture organisational responses that transcend damage control to achieve genuine enhancement through crisis exposure (Williams et al., 2017; Linnenluecke, 2017). The fundamental assumption that optimal crisis outcomes involve minimising disruption and returning to pre-crisis states potentially overlooks transformational possibilities that emerge through effective uncertainty navigation. This limitation constrains theoretical development

whilst providing inadequate guidance for organisations seeking competitive advantage through crisis conditions rather than simple survival.

Looking specifically at SMEs, they face distinctive challenges during crisis conditions that differentiate them significantly from larger organisational contexts, yet these differences remain inadequately theorised within existing literature. Resource constraints, including limited financial reserves, restricted access to capital markets, and reduced human capital depth, create vulnerabilities that can threaten survival during extended uncertainty periods (Thorgren & Williams, 2020; Kuckertz et al., 2020). These limitations are compounded by reduced bargaining power with suppliers and customers, limited diversification capabilities, and restricted access to professional crisis management expertise, creating cumulative disadvantages that traditional frameworks acknowledge but inadequately address.

At the same time, SMEs also possess structural advantages that may enable superior crisis navigation compared to larger organisations, yet these capabilities remain underexplored within crisis management literature. Entrepreneurial orientation, flat hierarchical structures, and concentrated decision-making authority can enable rapid response to changing conditions without bureaucratic delays that constrain larger organisations (Covin & Slevin, 1989; Davidsson et al., 2020). Informal networks, customer proximity, and operational simplicity may provide sensing advantages and adaptation capabilities that exceed those available to larger, more complex organisations. This is where the COVID-19 pandemic has highlighted both vulnerabilities and capabilities in SME crisis management whilst revealing significant variation in organisational responses across different contexts, sectors, and enterprise characteristics (Kraus et al., 2020; Kuckertz et al., 2020). Some enterprises have demonstrated remarkable adaptability, innovation, and even growth during crisis conditions, whilst others have struggled with basic survival requirements. Understanding the mechanisms underlying these differential responses represents a vital research priority for advancing both theoretical knowledge and practical guidance for SME crisis management, particularly regarding how resource constraints can be transformed into competitive advantages through creative utilisation and strategic innovation.

Hence why, understanding how crisis conditions can serve as catalysts for capability development, strategic enhancement, and competitive positioning requires systematic

investigation of organisational development processes during actual crisis conditions rather than retrospective analysis or theoretical speculation. The temporal dimension appears particularly crucial for understanding antifragile development, as transformation likely occurs through accumulated learning and capability building rather than discrete adaptive responses (Teece, 2007; Eisenhardt & Martin, 2000). This suggests that longitudinal research designs capable of capturing developmental processes over extended periods may be essential for advancing understanding of how organisations achieve genuine enhancement through adversity exposure.

Research Aims and Objectives

This research aims to develop understanding of how high-growth potential Scottish SMEs navigate extreme uncertainty and develop crisis management capabilities that enable organisational enhancement beyond pre-crisis potential. The investigation focuses specifically on the mechanisms through which sustained crisis exposure creates learning accumulation, capability development, and strategic transformation that transcends simple survival or recovery to achieve genuine antifragile development. This primary aim addresses fundamental gaps in crisis management theory whilst contributing empirical validation of organisational development concepts within SME contexts.

The research encompasses four specific objectives that collectively address theoretical, methodological, and practical dimensions of SME crisis management. The first objective involves integrating fragmented theoretical frameworks from crisis management, resilience, antifragility, sense-making, strategic adaptation, and resource innovation literatures into comprehensive understanding of SME uncertainty navigation that addresses current theoretical limitations and empirical gaps. This integration recognises that effective uncertainty navigation likely involves simultaneous operation of multiple theoretical mechanisms rather than isolated application of individual frameworks.

The second objective focuses on investigating temporal development of crisis management capabilities through longitudinal analysis of organisational learning, adaptation, and enhancement processes during extended uncertainty exposure. This temporal perspective addresses methodological limitations in existing literature whilst capturing developmental

dynamics that cross-sectional research designs cannot adequately address. The investigation seeks to understand how crisis management capabilities evolve through accumulated experience rather than simply examining discrete responses to specific crisis events.

The third objective involves identifying distinctive mechanisms through which resource-constrained, high-growth oriented entrepreneurial enterprises navigate extreme uncertainty, potentially revealing capabilities and approaches that differ substantially from large organisation crisis management whilst offering unique advantages for uncertainty navigation. This SME-specific focus addresses the limitation of existing frameworks developed primarily for large organisations whilst exploring how structural characteristics create distinctive crisis management patterns. The last objective involves developing practical frameworks and insights that can guide SME practitioners in developing crisis management to uncertainty navigation.

Research Questions

This investigation is guided by two overarching research questions that emerged from the theoretical gaps and practical challenges identified in the problem statement, supplemented by supporting questions that address specific aspects of SME crisis management capability development. The primary research question asks:

"How do high-growth potential Scottish SMEs make sense of extreme crisis conditions and develop crisis management and decision-making capabilities that enable organisational enhancement beyond pre-crisis potential?"

This question addresses the fundamental gap in understanding how SMEs navigate extreme uncertainty whilst potentially achieving transformation that exceeds simple survival or recovery. The question encompasses cognitive processes through sense-making frameworks, capability development through crisis management competencies, strategic processes through decision-making effectiveness, and outcomes through organisational enhancement,

recognising the complexity and multi-dimensional nature of SME crisis navigation. The secondary research question examines:

"How do crisis management capabilities evolve across five temporal phases in high-growth potential Scottish SMEs to enable survival and progressive organisational enhancement?"

This question addresses the temporal dimension of crisis management capability development, recognising that understanding organisational enhancement through crisis exposure requires investigation of developmental processes over extended periods rather than snapshot analysis of crisis responses. The reference to five temporal phases emerged from empirical analysis of the COVID-19 pandemic response timeline, providing a framework for understanding capability evolution through accumulated experience and iterative learning processes.

Supporting research questions guide specific aspects of the investigation, addressing sense-making processes that enable SMEs to construct coherent interpretations of extreme uncertainty whilst maintaining capacity for strategic action, examining how resource constraints influence crisis management approaches and understanding conditions under which limitations create competitive advantages rather than simply vulnerabilities. Additional questions explore the role of values and ethical considerations in SME crisis management and their interaction with strategic effectiveness and competitive positioning, investigate how collaborative relationships and institutional support systems influence individual enterprise crisis management capabilities and outcomes, and examine learning processes that enable SMEs to capture and integrate crisis experience into enhanced organisational capabilities for future uncertainty navigation.

Contribution to Knowledge

This research attempts to make several *theoretical* contributions to crisis management literature and broader organisational studies. The investigation contributes a fundamental

paradigmatic shift from traditional crisis management paradigms emphasising survival and recovery toward frameworks recognising extreme uncertainty as catalyst for organisational transformation and strategic enhancement. This paradigmatic shift challenges fundamental assumptions in crisis management theory whilst opening new avenues for understanding organisational development under adverse conditions. The research demonstrates that optimal crisis outcomes may involve enhancement rather than simply recovery, fundamentally reframing how scholars and practitioners conceptualise crisis management effectiveness.

The investigation provides dynamic theoretical integration demonstrating how multiple theoretical frameworks operate synergistically during uncertainty navigation, offering integrated understanding that transcends individual theoretical contributions. Current literature treats sense-making, strategic adaptation, resource innovation, and resilience as separate phenomena requiring distinct analytical frameworks, potentially missing crucial interaction effects that determine uncertainty navigation effectiveness. This research highlights how these frameworks operate simultaneously and interdependently, creating synergistic effects that enable organisational enhancement through crisis exposure.

The research contributes to temporal process understanding through longitudinal investigation of developmental processes through which crisis management capabilities evolve, revealing learning accumulation and capability building mechanisms that cross-sectional research designs cannot adequately capture. This temporal sensitivity enables understanding of how crisis management capabilities develop sophistication through practice whilst creating organisational memory that provides resources for future challenge navigation. The identification of five distinct temporal phases provides analytical frameworks for understanding capability evolution whilst challenging assumptions about crisis as discrete events rather than extended developmental processes. Additionally, this research's contribution challenges assumptions about resource constraints as purely limiting factors whilst demonstrating how structural characteristics create distinctive crisis management patterns that may exceed large organisation capabilities in certain contexts.

Next, the investigation establishes and introduces methodological improvements for investigating organisational phenomena during extreme uncertainty conditions. The research

demonstrates crisis-concurrent methodology that captures organisational development during actual crisis conditions rather than relying on retrospective analysis potentially influenced by hindsight bias, memory limitations, and post-hoc rationalisation. This methodological approach provides access to sense-making evolution and capability development as they occurred, revealing complexity and non-linearity in actual decision-making processes during crisis conditions.

The research utilises the COVID-19 pandemic as natural experiment enabling comparative analysis across diverse organisational contexts under consistent external conditions, providing analytical control difficult to achieve through typical organisational research approaches whilst maintaining real-world relevance and practical applicability. The pandemic's simultaneous impact across economic sectors enabled investigation of organisational responses across diverse contexts under controlled external conditions, maximising analytical rigour whilst preserving ecological validity. More specifically, this investigation demonstrates temporal sensitivity maintenance through monthly data collection frequency and longitudinal design providing methodological frameworks for capturing gradual changes and developmental processes requiring sustained observation periods. This approach reveals developmental characteristics that might be overlooked through snapshot approaches whilst contributing to process research methodology advancement for investigating complex organisational phenomena requiring extended observation periods.

Lastly, the research offers *practical* insights for policymakers and institutional support providers about effective approaches to enhancing ecosystem-level resilience through collaborative crisis management and coordinated support systems. The investigation reveals how institutional relationships can enhance individual enterprise capabilities whilst contributing to broader ecosystem resilience through knowledge sharing, resource coordination, and collaborative problem-solving approaches. The research demonstrates practical pathways through which organisations can achieve enhancement through adversity exposure, providing guidance for strategic approaches that transcend defensive crisis management toward transformational opportunity recognition. This contribution challenges

traditional crisis management assumptions whilst offering frameworks for achieving antifragile development through systematic capability building and strategic positioning.

Thesis Structure and Overview

This thesis progresses systematically through seven chapters that collectively address theoretical foundations, methodological frameworks, empirical investigation, analytical synthesis, and practical implications of SME crisis management capability development.

Chapter Two provides comprehensive literature review examining the evolution of crisis management theory and its application to SME contexts, with particular focus on organisational resilience and antifragility concepts. The chapter traces theoretical development from early disaster management approaches through more recent resilience frameworks to emerging antifragility theory, identifying persistent limitations in frameworks emphasising recovery rather than transformation. The chapter establishes that SMEs exhibit distinctive characteristics creating both vulnerabilities and adaptive advantages whilst examining the progression from engineering resilience through adaptive resilience to evolutionary resilience and antifragile development.

Chapter Three examines theoretical foundations underlying organisational responses to extreme uncertainty, focusing on sense-making theory, strategic adaptation mechanisms, and resource innovation processes whilst addressing integration challenges across fragmented theoretical domains. The chapter demonstrates how these domains operate interdependently during uncertainty navigation whilst identifying theoretical gaps constraining comprehensive understanding of SME crisis management effectiveness.

Chapter Four presents the comprehensive methodological framework for investigating SME crisis management through longitudinal case study methodology, establishing philosophical foundations grounded in interpretivist philosophy with social constructivist underpinnings. The chapter demonstrates how purely inductive qualitative methodology enabled generation of theoretical understanding from empirical observations whilst utilising the COVID-19 pandemic as unique natural experiment for comparative analysis across diverse organisational contexts.

Chapter Five presents detailed empirical findings from six high-growth Scottish SMEs during the COVID-19 pandemic, providing comprehensive case-by-case analysis structured around five temporal phases whilst revealing developmental processes and capability evolution through extensive participant quotations and cross-case pattern identification. The chapter documents decision-making in sense-making evolution, strategic adaptation, resource innovation, and collaborative relationship development as they occurred in real-time.

Chapter Six synthesises empirical findings into theoretical insights through comprehensive analysis of crisis management capability development, identifying five core themes and developing the Crisis Management Capability Development Model whilst discussing theoretical contributions and practical implications. The chapter demonstrates how temporal learning accumulation, values-based strategic frameworks, resource innovation under constraint, sense-making evolution, and antifragile development operate synergistically to enable organisational enhancement. Last *Chapter Seven* provides synthesis of research contributions, theoretical implications, practical recommendations, and directions for future research whilst reflecting on the investigation's significance for advancing crisis management understanding and SME support systems.

Conclusion

This introduction establishes comprehensive foundations for investigating crisis management capability development in high-growth Scottish SMEs through examination of theoretical gaps, practical challenges, and research opportunities created by the COVID-19 pandemic. The research addresses fundamental limitations in existing crisis management literature that emphasise large organisation perspectives, employ cross-sectional methodologies missing temporal development processes, and maintain survival-oriented paradigms potentially overlooking transformation possibilities through effective uncertainty navigation.

The investigation employs innovative methodological approaches capturing real-time organisational development during extreme uncertainty, providing empirical validation of theoretical concepts whilst generating practical frameworks for SME crisis management. The comprehensive scope encompasses cognitive dimensions through sense-making processes, strategic dimensions through adaptation mechanisms, operational dimensions through

resource innovation, and collaborative dimensions through stakeholder relationship development, maintaining focus on distinctive SME characteristics and capabilities throughout.

The research contributes significant theoretical advancement through paradigmatic shift from survival-focused to enhancement-focused crisis management frameworks, dynamic integration of fragmented theoretical domains, temporal process understanding of capability development and empirical validation of capability and organisational development concepts. Methodological contributions include crisis-concurrent investigation approaches, natural experiment utilisation, and temporal sensitivity maintenance enabling developmental process capture. Practical contributions encompass evidence-based guidance for SME practitioners, policy insights for institutional support enhancement, and frameworks for achieving antifragile development through systematic capability building. The systematic progression through subsequent chapters develops these foundations through comprehensive literature review establishing theoretical gaps, integrated theoretical framework addressing fragmentation limitations, innovative methodological approach enabling real-time developmental investigation, detailed empirical findings documenting capability evolution, analytical synthesis generating theoretical insights, and comprehensive conclusion establishing research significance whilst identifying future research directions.

Definitions of Key Terms

Crisis management encompasses the systematic process through which organisations navigate extreme uncertainty, disruption, and threat whilst maintaining operational continuity and strategic coherence, extending beyond traditional damage control approaches to encompass capability development and strategic enhancement possibilities (Pearson & Clair, 1998; Bundy et al., 2017). This definition recognises crisis management as dynamic capability development process rather than simply reactive response to specific threatening events.

Antifragility represents the characteristic of systems that benefit from stress, volatility, and uncertainty, becoming stronger and more capable through adverse exposure rather than simply resisting or recovering from disruption (Taleb, 2012). Applied to organisational

contexts, antifragility involves transformation that exceeds pre-crisis potential through systematic utilisation of stress as information and energy source for enhancement rather than simply maintaining stability or recovering effectiveness.

Sense-making constitutes the cognitive process through which organisations construct meaning from ambiguous, complex, or contradictory environmental information, enabling coherent action despite incomplete understanding (Weick, 1995). The process encompasses identity construction, retrospective learning, environmental enactment, and collective interpretation whilst recognising that organisational environments are constructed interpretations emerging through active cognitive engagement rather than objective assessment of predetermined conditions.

Effectuation Logic is the entrepreneurial decision-making approach under uncertainty that focuses on leveraging available means rather than pursuing predetermined goals, emphasising affordable loss, strategic partnerships, and contingency exploitation (Sarasvathy, 2001, 2008).

Bricolage is the process of "making do" through creative recombination of resources at hand for purposes different from their original intention, involving input bricolage (physical resources), labour bricolage (skills/knowledge), and institutional bricolage (regulatory navigation) (Baker & Nelson, 2005; Levi-Strauss, 1967).

Dynamic Capabilities is the organisation's capacity to integrate, build, and reconfigure internal and external competences to address rapidly changing environments, encompassing sensing, seizing, and transforming capabilities (Teece, 2007). Critical for understanding how crisis management capabilities evolved.

Emergent Strategy represent strategic patterns that develop through organisational learning and adaptive response rather than deliberate planning, contrasting with intended strategies and enabling flexibility under uncertainty (Mintzberg, 1994).

Resilience (Engineering vs. Adaptive vs. Evolutionary) Resilience encompasses the capacity of systems to absorb disturbance, maintain function, and adapt to changing conditions, though conceptualisations vary significantly across different theoretical traditions (Holling,

1973; Walker et al., 2004; Folke, 2006). Engineering resilience emphasises returning to pre-disturbance states; adaptive resilience focuses on learning and adaptation; evolutionary resilience encompasses fundamental transformation through crisis exposure (Holling, 1973; Folke, 2006).

Compound Crisis is the layering of multiple crisis conditions simultaneously, requiring sophisticated capability integration rather than discrete responses.

High-growth potential SMEs represent small and medium-sized enterprises characterised by strategic ambitions for significant expansion, innovative capabilities, entrepreneurial orientation, and demonstrated growth indicators, typically supported by institutional development programmes and possessing resources and capabilities that differentiate them from survival-oriented or lifestyle businesses (Brown & Mason, 2017). This definition recognises enterprises with strategic orientation toward growth rather than simple survival or lifestyle maintenance.

Temporal learning accumulation describes the developmental process through which sustained exposure to challenging conditions creates learning accumulation enhancing organisational potential through progressive capability enhancement rather than simple adaptation (Teece, 2007). This process creates organisational memory providing resources for future challenge navigation whilst enabling sophistication development through accumulated experience rather than discrete training activities.

Resource innovation encompasses the process whereby organisations create value through creative recombination and application of available resources rather than optimal resource acquisition, particularly relevant under constraint conditions where limitations stimulate innovative approaches to value creation and competitive positioning (Baker & Nelson, 2005). This concept challenges traditional resource-based assumptions about resource accumulation as prerequisite for strategic effectiveness.

Values-based crisis management involves the integration of ethical considerations and personal values with strategic decision-making during crisis conditions, challenging assumptions about trade-offs between ethical behaviour and competitive effectiveness

whilst potentially creating stakeholder relationship advantages and competitive differentiation (Alpaslan et al., 2009). This approach recognises values as strategic resources rather than constraints on strategic effectiveness.

Crisis management capabilities represent dynamic organisational abilities to sense environmental changes, interpret their implications, mobilise appropriate responses, and integrate learning for enhanced future performance, encompassing cognitive, strategic, operational, and collaborative dimensions that develop through accumulated experience (Teece, 2007; Eisenhardt & Martin, 2000). These capabilities enable organisations to navigate uncertainty effectively whilst potentially achieving enhancement through adversity exposure.

Chapter two: Literature review on Crisis Management in SME Contexts

Introduction

The study of crisis management has evolved significantly since its emergence as a distinct academic discipline in the late 20th century, progressing from a focus on large-scale disasters and corporate failures to encompass a broader understanding of how organisations navigate extreme uncertainty and environmental turbulence (Pearson & Clair, 1998; Bundy et al., 2017). Within this evolution, small and medium-sized enterprises (SMEs) have received increasing attention as researchers and practitioners have recognised their unique vulnerability to external shocks, coupled paradoxically with their potential for rapid adaptation and innovation under extreme conditions (Herbane, 2010; Smallbone et al., 2012). The COVID-19 pandemic has served as an unprecedented natural experiment in organisational crisis management, providing unique insights into how SMEs navigate sustained periods of uncertainty whilst simultaneously revealing the limitations of traditional crisis management frameworks that were primarily developed for larger organisational contexts (Cowling et al., 2020; Kuckertz et al., 2020).

This chapter provides a comprehensive review of crisis management and organisational resilience literature with particular emphasis on SME contexts, examining the evolution of theoretical frameworks from early disaster management approaches through modern resilience and antifragility concepts. The review reveals a significant theoretical gap between traditional crisis management paradigms that emphasise survival and recovery and emerging evidence that some organisations can achieve enhancement through crisis exposure. This gap becomes particularly pronounced in SME contexts, where resource constraints and structural flexibility create unique conditions for both vulnerability and adaptive capacity that challenge conventional crisis management assumptions.

The chapter is structured around four core themes that emerge from the literature. First, the historical development of crisis management theory is examined, tracing the evolution from reactive damage control approaches to proactive resilience building frameworks. Second, the specific characteristics of SME crisis management are analysed, highlighting how resource constraints, structural flexibility, and entrepreneurial orientation create distinct crisis

management requirements and capabilities. Third, contemporary developments in organisational resilience theory are reviewed, examining the progression from recovery-focused models to adaptive and transformative resilience concepts. Finally, the emerging literature on antifragility in organisational contexts is explored, revealing how some organisations can gain strength from adversity exposure rather than simply maintaining stability or recovering to previous performance levels.

The Evolution of Crisis Management Theory

Early Foundations and Disaster Management Origins

Crisis management as an academic discipline emerged from disaster management research in the 1960s and 1970s, with early scholars focusing primarily on natural disasters, technological failures, and large-scale emergencies (Quarantelli, 1988; Turner, 1976). These foundational works established crisis management as a predominantly reactive discipline, emphasising rapid response, damage limitation, and recovery to pre-crisis states. Quarantelli's (1988) seminal work on disaster response established what became known as the "command and control" model of crisis management, characterised by centralised decision-making, hierarchical communication structures, and standardised response procedures designed to minimise disruption and restore normal operations as quickly as possible. While Turner's (1976) "man-made disasters" framework introduced the concept of crisis incubation, proposing that organisational crises develop through accumulation of unnoticed events and warning signals that exceed organisational processing capacity. Before Turner, all disasters and major accidents, and not just those that were purely natural, such as earthquakes, were largely treated as unique or random, so the focus was on response not prevention. His MMD framework was the influential work that demonstrated that it was possible to identify precursors and seek to improve foresight and prevention. This perspective represented an early recognition that crises involve cognitive and interpretive challenges rather than simply operational or technical problems. However, Turner's framework remained focused on prevention and early intervention rather than adaptive response or organisational learning, reflecting the dominant paradigm of crisis management as damage control rather than development opportunity.

The Sequence of Events Associated with a Failure of Foresight	
Stage I	**Notionally normal starting point:** (a) Initial culturally accepted beliefs about the world and its hazards (b) Associated precautionary norms set out in laws, codes of practice, mores, and folkways.
Stage II	**Incubation period:** the accumulation of an unnoticed set of events which are at odds with the accepted beliefs about hazards and the norms for their avoidance.
Stage III	**Precipitating event:** forces itself to the attention and transforms general perceptions of Stage II.
Stage IV	**Onset:** the immediate consequences of the collapse of cultural precautions become apparent.
Stage V	**Rescue and salvage — first stage adjustment:** the immediate postcollapse situation is recognized in ad hoc adjustments which permit the work of rescue and salvage to be started.
Stage VI	**Full cultural readjustment:** an inquiry or assessment is carried out, and beliefs and precautionary norms are adjusted to fit the newly gained understanding of the world.

Table 2.0 - The Sequence of Events Associated with a Failure of Foresight. Reproduced from Turner, 1976, p. 381

Whilst Turner's (1976) framework provided valuable insights into how organisations fail to recognise emerging threats, its underlying assumption that optimal crisis management involves better prediction and prevention reflects what Weick and Sutcliffe (2007) later critiqued as "reliability thinking" that prioritises error elimination over learning enhancement.

Furthermore, the 1980s witnessed expansion of crisis management research into corporate and organisational contexts, with scholars such as Mitroff (1988) and Shrivastava (1993) developing frameworks for understanding how organisations prepare for, respond to, and recover from various crisis types. Mitroff's (1988) crisis management framework introduced the concept of crisis types and organisational preparedness, proposing that effective crisis management requires systematic preparation across multiple crisis categories including natural disasters, technological failures, confrontation crises, malevolence, and skewed management values. This typological approach provided practical guidance for crisis planning but maintained the assumption that optimal crisis management involves returning to pre-crisis operational states with minimal disruption. This is where the Pearson and Mitroff's five-phase model - *signal detection, probing and prevention, damage containment, recovery,* and

learning, whilst systematic, remained focused on damage limitation rather than exploring how crisis conditions might enable organisational enhancement.

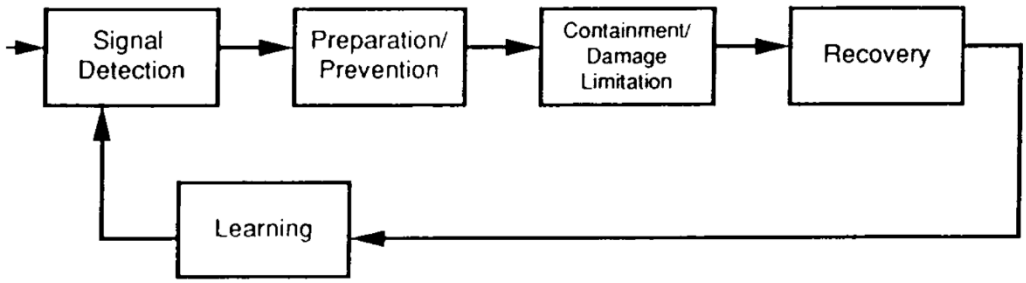


Figure 2.0 - The five Phases of Crisis Management. Reproduced from Pearson and Mitroff, 1993

It is suggested that nearly all types of crises go through the stages or phases outlined in the above framework, implying that "different dangers and opportunities are inherent in each phase…organisations can increase their ability to manage crises by properly managing each phase of the process" (Pearson and Mitroff, 1993, p. 52). Their attempt at conceptualising the crisis management process is quite simple and clear; however, at the same time, it might not succeed at offering insights into how crises are truly managed.

The 1990s marked a significant shift towards strategic perspectives on crisis management, with researchers beginning to examine how crises affect competitive positioning, stakeholder relationships, and long-term organisational viability (Pearson & Clair, 1998; Pauchant & Mitroff, 1992). Pearson and Clair's (1998) influential definition of organisational crisis as "a low-probability, high-impact event that threatens the viability of the organisation" reveals fundamental conceptual limitations that pervade crisis management literature. The assumption that 'low-probability' events represent the primary crisis challenge becomes problematic when applied to entrepreneurial contexts where uncertainty and volatility represent normal operating conditions rather than exceptional circumstances (Alvarez & Barney, 2007). More fundamentally, the emphasis on 'threat to viability' preserves defensive orientations that may prevent recognition of crisis-enabled development opportunities, particularly in SME contexts where rapid adaptation and experimentation represent core organisational capabilities rather than emergency responses. This definition emphasised the strategic implications of crisis management whilst maintaining focus on threat mitigation

rather than opportunity creation. The strategic perspective introduced important concepts including crisis communication, stakeholder management, and reputation protection that expanded crisis management beyond operational response to encompass broader organisational relationships and competitive positioning (Coombs, 2007). However, these developments continued to frame crisis management as defensive activity aimed at protecting existing strategic positions rather than leveraging crisis conditions for strategic advancement or organisational development.

Furthermore, Rosenthal et al. (1989) contributed to the strategic perspective through their analysis of crisis decision-making under time pressure and uncertainty, identifying how crisis conditions affect cognitive processing, information gathering, and strategic choice. Their work highlighted the importance of decision-making quality during crisis periods whilst acknowledging that traditional strategic planning approaches may be inadequate under extreme uncertainty. Despite these insights, their framework remained focused on maintaining decision-making quality under pressure rather than exploring how crisis conditions might enable enhanced decision-making capabilities or strategic innovation.

The progression from early disaster management approaches to strategic crisis perspectives created foundations for more sophisticated theoretical developments in the 21st century, as researchers began to recognise the limitations of linear, prediction-based frameworks when applied to complex organisational environments characterised by uncertainty and emergent properties.

Modern Crisis Management Frameworks

Modern crisis management scholarship has increasingly embraced complexity perspectives that recognise organisations as adaptive systems operating within dynamic environments characterised by non-linear relationships and emergent properties (Comfort, 2019; Uhl-Bien & Arena, 2018). This influenced by insights from complexity science and organisational learning theory, represents significant advancement through its recognition that effective crisis management requires adaptive capabilities rather than predetermined response procedures. The 21st century has witnessed increasing sophistication in crisis management

theory, with researchers developing more nuanced understandings of crisis dynamics, organisational responses, and outcome variations (Boin et al., 2005; Bundy et al., 2017).

Boin et al. (2005) proposed a comprehensive framework examining crisis management across five critical tasks: *early warning and signal detection, sense-making and meaning construction, decision-making and coordination, implementation* and *communication,* and *learning and accountability*. This framework recognised crisis management as a complex, multi-dimensional process requiring sophisticated organisational capabilities rather than simple response procedures.

- *Sense making*: collecting and processing information that will help crisis managers to detect an emerging crisis and understand the significance of what is going on during a crisis.
- *Decision making* and *coordinating*: making critical calls on strategic dilemmas and orchestrating a coherent response to implement those decisions.
- *Meaning making*: offering a situational definition and narrative that is convincing, helpful, and inspiring to citizens and responders.
- *Accounting*: explaining in a public forum what was done to prevent and manage the crisis and why.
- *Learning*: determining the causes of a crisis, assessing the strengths and weaknesses of the responses to it, and undertaking remedial action based on this understanding.

Table 2.1 – The Five critical tasks of strategic crisis leadership. Reproduced from Boin et al., 2005

The above five-task framework by Boin et al., (2005) represents a moment in crisis management scholarship, marking the transition from simplistic linear models to recognition of crisis management as a complex, multi-dimensional organisational capability requiring simultaneous attention to multiple interconnected processes. However, whilst the framework's theoretical sophistication advanced academic understanding, its practical application reveals significant limitations when applied to SME contexts, where resource constraints and structural characteristics create implementation challenges that the framework's designers did not fully anticipate. Their emphasis on early warning and signal detection reflects sophisticated understanding that effective crisis management begins well before crisis onset through systematic environmental scanning and threat identification (Boin et al., 2005; 't Hart et al., 1993).

The framework recognises that organisations must develop capabilities for detecting weak signals, interpreting ambiguous information, and distinguishing genuine threats from routine environmental noise. The theoretical sophistication emerges through integration of organisational learning theory, information processing concepts, and strategic management perspectives that emphasise environmental scanning as crucial organisational capability (Aguilar, 1967; Daft & Weick, 1984). Where this integration represents significant advancement over reactive crisis management approaches that focus solely on response after crisis onset.

However, empirical evidence from SME crisis experiences reveals fundamental challenges in implementing early warning systems that reflect structural and resource characteristics rather than theoretical inadequacies, as such frameworks requiring resources that SMEs fundamentally lack not due to inadequate implementation but due to structural characteristics that may actually provide alternative advantages. This mismatch reveals deeper theoretical assumptions about optimal organisational design that may be inappropriate for entrepreneurial contexts where informal adaptation often proves superior to formal planning systems. SMEs typically lack dedicated personnel for environmental scanning, complex information systems for data collection and analysis, and analytical capabilities for interpreting complex environmental signals (Herbane, 2010; Smallbone et al., 2012). This mismatch reveals deeper theoretical assumptions about optimal organisational design that may be inappropriate for entrepreneurial contexts where informal adaptation often proves superior to formal planning systems.

This is where Bundy et al.'s (2017) systematic review of crisis management literature identified three dominant theoretical perspectives: *structural-functional approaches* emphasising organisational design and preparedness systems; *symbolic-interpretive approaches* focusing on meaning construction and stakeholder communication; and *critical-postmodern approaches* examining power dynamics and social construction of crisis. This theoretical diversity reflects increasing recognition that crisis management involves complex interactions between structural, cognitive, and social factors that cannot be understood through single theoretical lenses.

The structural-functional emphasis on organisational design and preparedness systems assumes that effective crisis management emerges from systematic planning and formal response procedures. However, empirical evidence consistently shows that SMEs rarely possess formal crisis management systems, yet many demonstrate remarkable crisis effectiveness (Herbane, 2010; Williams et al., 2017). During COVID-19, the most successful SMEs were often those with minimal formal planning who adapted rapidly through informal networks and experimental approaches. For example, UK research by Cowling et al. (2020) found that SMEs with elaborate business continuity plans often struggled more than those who simply "figured it out as they went along". The planned responses proved inadequate for unprecedented conditions, whilst informal adaptation enabled creative solutions.

The symbolic-interpretive focus on meaning construction and stakeholder communication captures important aspects of how SMEs understand and communicate about crisis conditions. However, empirical evidence shows that SMEs facing existential threats cannot simply "sense-make" their way to survival without concrete actions and resource mobilisation. This is where the Covid-19 revealed that whilst sense-making was important, SMEs needed immediate access to cash, customers, and operational capabilities. Enterprises that spent too much time trying to understand the situation often ran out of time to act. Conversely, those that acted first and made sense later often achieved better outcomes.

Lastly, the critical-postmodern perspective's emphasis on power dynamics and social construction provided crucial insights during Covid-19, particularly regarding how crisis resources were allocated. Large corporations received financial support, whilst many SMEs faced bureaucratic barriers to support programs (Brown & Rocha, 2020).

Despite these theoretical advances, contemporary crisis management frameworks continue to emphasise adaptation and recovery rather than transformation and enhancement. Even sophisticated models such as Coombs' (2007) situational crisis communication theory (SCCT) and Alpaslan et al.'s (2009) crisis management capabilities framework focus primarily on damage limitation and stakeholder relationship maintenance rather than exploring how crisis conditions might enable organisational development beyond pre-crisis potential. Coombs' SCCT provides an evidence-based framework for understanding how to maximise

the reputational protection afforded by postcrisis communication and represents sophisticated thinking about crisis communication. However, SME research during COVID-19 revealed that stakeholder attributions were often irrelevant to crisis outcomes. What mattered more was immediate stakeholder support and collaborative problem-solving, as many SMEs found that honest communication about struggles and requests for help were more effective than attribution management.

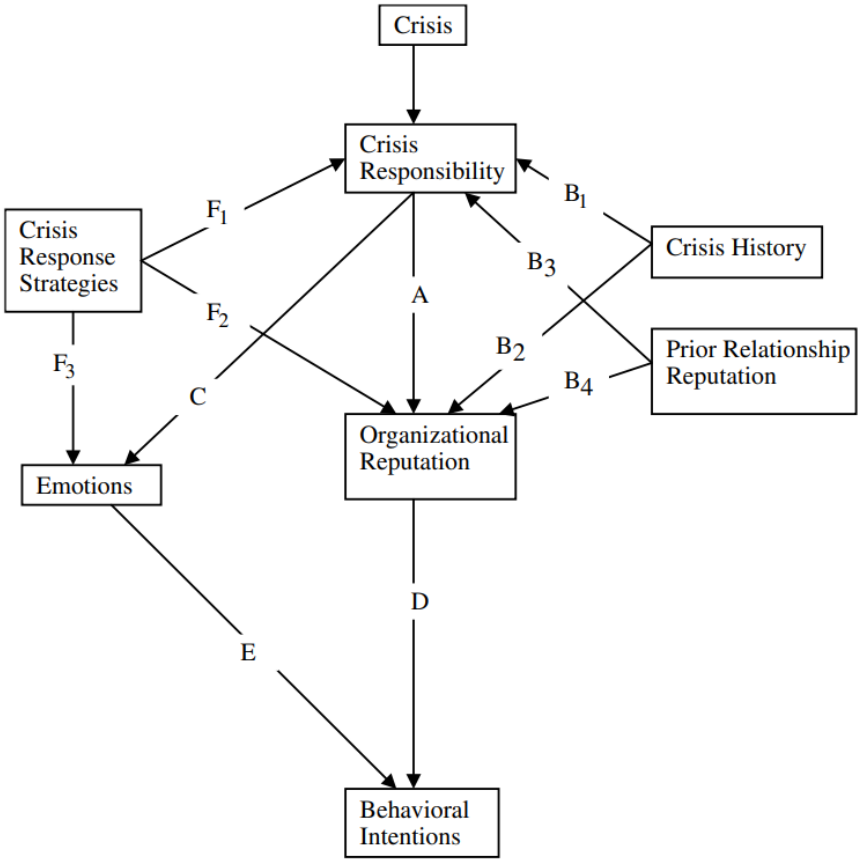


Figure 2.1 - Crisis situation model of SCCT. Reproduced from Coombs, 2017

The strategic paradigm's defensive orientation becomes particularly limiting when applied to SME contexts, where resource constraints force organisations to pursue opportunities aggressively rather than focusing primarily on threat protection (Shane & Venkataraman, 2000). The paradigm's emphasis on reputation management and stakeholder damage control may be inappropriate for early-stage enterprises that lack established reputations to protect, whilst its focus on maintaining strategic positions ignores possibilities for crisis-driven strategic transformation that could enhance competitive positioning. More fundamentally, the strategic paradigm's continued emphasis on low-probability events contradicts

entrepreneurial literature suggesting that uncertainty and volatility represent normal operating conditions rather than exceptional circumstances (Alvarez & Barney, 2007). This conceptual mismatch suggests the need for paradigmatic frameworks that treat uncertainty as opportunity source rather than threat to be managed, although there are studies that have focused specifically on that (Davidsson et al., 2022).

Similarly, Alpaslan et al.'s (2009) crisis management capabilities framework identifies important organisational capabilities but struggles to explain how resource-constrained SMEs actually develop and deploy these capabilities in practice. The capabilities framework assumes organisations can invest in capability development, but SMEs often face immediate survival pressures that prevent capability investment. Especially during COVID-19, SMEs needed to deploy capabilities they did not have time to develop systematically. Nonetheless, many SMEs discovered they could borrow, improvise, or rapidly develop capabilities through network relationships and creative resource utilisation that the framework doesn't adequately address. For instance, the research by Kuckertz et al. (2020) found that startup companies with formal crisis plans took longer to adapt to pandemic conditions than those that immediately began experimenting with new approaches, as the formal plans created cognitive constraints that slowed adaptation.

Building on the above, traditional crisis management paradigms face several fundamental limitations when applied to modern organisational contexts, particularly SME environments characterised by resource constraints, structural flexibility, and entrepreneurial orientation (Herbane, 2019). First, the emphasis on standardised response procedures and centralised decision-making contradicts the adaptive and experimental approaches that characterise entrepreneurial organisations (Davidsson et al., 2020). Second, the focus on recovery to pre-crisis states assumes that previous organisational configurations represent optimal arrangements, ignoring possibilities for crisis-driven improvement and innovation (Duchek, 2020). Third, the defensive orientation of traditional frameworks may discourage the risk-taking and experimentation that enable entrepreneurial organisations to identify and exploit opportunities created by environmental disruption (Doern et al., 2019).

The COVID-19 pandemic has highlighted these limitations by demonstrating how some organisations, particularly SMEs, have achieved significant enhancement through crisis

exposure rather than simply surviving or recovering (Kraus et al., 2020; Kuckertz et al., 2020). These observations suggest the need for new theoretical frameworks that can account for transformative crisis responses whilst maintaining insights from traditional approaches regarding the challenges and risks of crisis management.

Furthermore, the resource-based perspective on crisis management, advanced by Barton (2001) and James and Wooten (2005), examines how organisations deploy existing resources and capabilities to address crisis conditions whilst maintaining operational effectiveness. This literature emphasises resource mobilisation, capability deployment, and strategic resource allocation to address immediate crisis challenges whilst preserving organisational assets and competitive positioning. However, this perspective maintains the fundamental assumption that crisis consumes rather than creates organisational resources, treating resource management during crisis as defensive activity rather than opportunity for resource innovation or capability development.

Additionally, crisis response literature has also emphasised the importance of organisational learning and capability development through crisis experience, with works by Elliott and Smith (2006) and Lampel et al. (2009) examining how organisations capture crisis learning to improve future crisis preparedness. This post-crisis learning perspective recognises that crisis experience can enhance organisational capabilities but conceptualises learning as preparation for future crisis events rather than as foundation for strategic transformation or competitive advantage creation. The learning is positioned as defensive improvement rather than strategic enhancement that could exceed pre-crisis organisational potential. Below table synthesises theoretical development whilst highlighting systematic SME applicability gaps that existing frameworks fail to address. The progression reveals increasing sophistication in theory whilst maintaining large-organisation assumptions that disadvantage resource-constrained enterprises

Period	Key Contributors	Theoretical Focus	Key Frameworks	Limitations for SMEs
1960s-1970s Disaster	Quarantelli (1988); Turner (1976); White (1974)	Reactive response to natural disasters	Turner's six-stage model; Quarantelli's	Purely reactive approach; Focus on damage control;

Management Origins		and technological failures	disaster response model	Limited organisational learning
1980s-1990s Organisational Crisis Management	Mitroff (1988); Shrivastava (1993); Pauchant & Mitroff (1992)	Corporate crisis preparedness and response systems	Mitroff's crisis types; Pearson & Mitroff five-phase model	Recovery-focused objectives; Standardised approaches; Limited strategic perspective
1990s-2000s Strategic Crisis Management	Pearson & Clair (1998); Coombs (2007); Rosenthal et al. (1989)	Strategic implications and stakeholder management during crises	SCCT framework; Strategic crisis definition; Decision-making models	Defensive strategic orientation; Reputation protection focus; Limited transformation perspective
2000s-2010s Contemporary Frameworks	Boin et al. (2005); Bundy et al. (2017); Alpaslan et al. (2009)	Multi-dimensional crisis management processes and capabilities	Five critical tasks model; Crisis management capabilities framework	Continued recovery emphasis; Limited SME application; Adaptation rather than transformation
2010s-Present Emerging Paradigms	Duchek (2020); Kraus et al. (2020); Taleb (2012)	Resilience, adaptation, and antifragile development	Resilience process model; Crisis entrepreneurship framework; Antifragility spectrum	Limited empirical validation; Theoretical fragmentation; SME-specific gaps remain

Table 2.2 - Evolution of Crisis Management Theory - Key Developments and Limitations. Author, 2024

Additionally, this temporal fragmentation limits understanding of how crisis management capabilities develop through sustained exposure to uncertainty and stress, creating gaps in knowledge about the mechanisms that enable some organisations to achieve enhancement rather than mere survival through crisis experience. The temporal dimension appears crucial for understanding SME crisis management, where rapid adaptation cycles and experimental

learning create distinctive patterns of capability development that may differ significantly from those observed in larger organisational contexts. While again, for instance, Boin et al.'s (2005) five-task framework represents theoretical advancement, its application to SME contexts reveals persistent bias toward large organisational assumptions that characterise the field.

These theoretical tensions become particularly pronounced when examining the relationship between crisis management and entrepreneurship literatures, where effectuation logic directly contradicts traditional planning-based approaches (Sarasvathy, 2001). The COVID-19 evidence suggests that this contradiction may not be merely academic, but it may reflect fundamentally different organisational capabilities that determine crisis outcomes. SMEs that succeeded through rapid experimentation and means-driven adaptation often outperformed those with elaborate formal plans, suggesting that theoretical integration rather than paradigmatic dominance may be required for comprehensive understanding.

The persistent emphasis on 'returning to normal' across traditional frameworks creates recovery bias, where this bias becomes particularly limiting when applied to high-growth SMEs whose normal state involves continuous change and adaptation, making 'recovery' conceptually inappropriate. The emergence of antifragility concepts provides promising direction for addressing this bias, but empirical validation through systematic investigation remains crucial for theoretical development.

Digital Transformation as Crisis Management Strategy

The COVID-19 pandemic has revealed digital transformation as a critical crisis management mechanism, fundamentally altering how organisations maintain operations, engage stakeholders, and create competitive advantages during periods of physical restriction and market disruption (Kraus et al., 2020; Papadopoulos et al., 2020). For SMEs, digital capabilities often determined the difference between business failure and survival, with some enterprises achieving remarkable growth through crisis-driven digital acceleration that compressed normal transformation timelines from years to months (Verhoef et al., 2021; Vial, 2019).

Digital readiness prior to crisis onset has emerged as a crucial factor determining organisational crisis management effectiveness, with enterprises possessing basic digital infrastructure and capabilities demonstrating superior adaptation capacity compared to those requiring fundamental digital development during crisis conditions (Klein & Todesco, 2021). Digital readiness encompasses technological infrastructure including reliable internet connectivity and cloud-based systems, digital literacy among staff enabling rapid adoption of new technologies, and existing online presence through websites and social media platforms that can be rapidly scaled for crisis response (Guo et al., 2020).

Technology-enabled business model innovation represents perhaps the most significant crisis management application of digital capabilities, with SMEs leveraging digital platforms to create entirely new revenue streams and customer engagement approaches during crisis periods (Papadopoulos et al., 2020). Examples include restaurants developing delivery and meal kit services, retail businesses creating online storefronts and virtual shopping experiences, and service providers developing digital service delivery mechanisms that maintain customer relationships whilst complying with physical distancing requirements. These innovations often involved creative recombination of existing digital tools rather than sophisticated technology development, suggesting that digital crisis management depends more on cognitive flexibility and experimental mindsets than technical expertise.

Furthermore, virtual stakeholder engagement capabilities have become essential for maintaining business relationships and collaborative problem-solving during crisis periods when physical interaction becomes impossible or restricted (Kraus et al., 2020). SMEs that developed effective virtual engagement approaches often achieved enhanced stakeholder relationships through increased communication frequency and collaborative problem-solving that might not have emerged under normal operational conditions. These capabilities include video conferencing for client meetings and team coordination, social media platforms for community engagement and customer communication, and digital collaboration tools for remote project management and stakeholder coordination.

E-commerce and digital marketing acceleration during crisis periods has enabled many SMEs to access new customer segments and geographical markets that were previously unavailable through traditional sales channels (Verhoef et al., 2021). Crisis-driven digital marketing often

involved rapid experimentation with social media advertising, content marketing, and search engine optimisation that created customer acquisition capabilities exceeding pre-crisis levels. The development of e-commerce capabilities often required integration of multiple digital platforms including payment processing, inventory management, and customer service systems that enhanced overall operational efficiency.

However, digital transformation as crisis management strategy also presents significant challenges for SMEs, particularly those lacking pre-crisis digital foundation or technical expertise (Klein & Todesco, 2021). The rapid pace of crisis-driven digital adoption often occurs without systematic planning or training, creating operational vulnerabilities and customer service challenges that may damage business relationships. Additionally, increased reliance on digital platforms may create new dependencies and security risks that require ongoing management and investment. The COVID-19 experience suggests that digital capabilities represent both crisis management tool and strategic development opportunity, enabling SMEs to accelerate organisational capabilities whilst addressing immediate crisis challenges. This dual function of digital transformation during crisis periods challenges traditional assumptions about crisis management as purely defensive activity, revealing how crisis conditions can catalyse organisational development that exceeds pre-crisis potential.

SME Crisis Management: Characteristics and Challenges

Resource Constraints and Structural Characteristics

Small and medium-sized enterprises exhibit distinctive characteristics that fundamentally shape their crisis management capabilities and requirements, creating both vulnerabilities and adaptive advantages that distinguish them from larger organisational contexts (Herbane, 2010, 2019). The defining characteristic of SMEs is their limited resource base that creates what Penrose (1959) characterised as "resource constraints" that affect all aspects of organisational functioning including crisis preparedness, response capabilities, and recovery potential. These constraints manifest across multiple dimensions including financial resources, human capital, technological infrastructure, and institutional relationships, creating complex interdependencies that amplify both crisis vulnerability and adaptive pressure (Smallbone et al., 2012).

Similarly, Herbane's (2010) comprehensive review of SME crisis management reveals that smaller enterprises face unique challenges including limited resource reserves, reduced access to external support, and constrained crisis management capabilities that increase vulnerability to crisis conditions. This literature establishes SMEs as particularly susceptible to crisis damage due to resource limitations and reduced organisational slack that constrains response options.

Firstly, financial resource constraints represent the most visible limitation affecting SME crisis management, with limited cash reserves, restricted access to capital markets, and dependence on short-term financing creating vulnerability to revenue disruption and limiting investment in crisis preparedness systems (Beck & Demirguc-Kunt, 2006). Unlike large corporations that can absorb temporary losses through diversified revenue streams and financial reserves, SMEs typically operate with thin margins and limited financial buffers that provide minimal protection against extended disruption periods (Cowling et al., 2015). This financial vulnerability forces SMEs to prioritise immediate survival over strategic crisis management, limiting their ability to invest in preparedness systems or pursue transformative crisis responses that require upfront resource commitments.

Secondly, human capital constraints create additional challenges for SME crisis management, with limited staff numbers forcing individuals to assume multiple roles and responsibilities that can become overwhelming during crisis periods when workload increases while staff availability may decrease due to health concerns, childcare responsibilities, or other crisis-related factors (Battisti & Deakins, 2017). The absence of dedicated crisis management specialists means that crisis response typically falls to owner-managers or senior staff who must balance crisis management responsibilities with ongoing operational requirements, potentially compromising both crisis response quality and normal business functioning.

Thirdly, technological infrastructure limitations affect SME crisis management through restricted access to sophisticated information systems, communication technologies, and digital platforms that enable remote operations, virtual collaboration, and real-time monitoring of crisis developments (Papadopoulos et al., 2020). These limitations became particularly pronounced during the COVID-19 pandemic, where digital capabilities determined organisational capacity for remote operations, virtual customer engagement, and supply chain coordination under mobility restrictions.

Recent empirical studies of SME crisis management during the COVID-19 pandemic have reinforced the survival paradigm through examination of defensive strategies, government support utilisation, and business model adaptations focused on operational continuity (Cowling et al., 2020; Kraus et al., 2020). These studies document SME responses including cost reduction, digital transformation for operational continuity, and institutional support seeking, conceptualising these adaptations as survival strategies rather than strategic development opportunities. The emphasis remains on how SMEs can maintain operations and avoid business failure rather than how crisis conditions might enable strategic transformation or competitive advantage creation.

The entrepreneurship literature addressing crisis response has similarly emphasised survival-oriented outcomes, with studies by Kuckertz et al. (2020) and Papadopoulos et al. (2020) examining how entrepreneurial ventures adapt business models and operational approaches to maintain viability during extreme uncertainty. Whilst this literature acknowledges entrepreneurial creativity and adaptability during crisis conditions, the focus remains on survival and continuity rather than enhancement or transformation that could exceed pre-crisis venture potential. The underlying assumption persists that crisis represents threat to entrepreneurial ventures rather than opportunity for accelerated development or strategic positioning improvement.

Regional Innovation Systems and Scottish SME Crisis Management Context

The Scottish SME ecosystem presents distinctive characteristics that shape crisis management capabilities through institutional support systems, regional innovation networks, and cultural factors that influence entrepreneurial behaviour and crisis response approaches (Cooke et al., 1997; Huggins & Johnston, 2009). Scottish Enterprise and Highlands and Islands Enterprise provide institutional support infrastructure that creates unique resource access patterns during crisis periods, potentially altering traditional SME resource constraint dynamics identified in general crisis literature through systematic support provision and collaborative relationship development.

The Scottish Government's approach to crisis support during COVID-19 reflected broader patterns of institutional responsiveness that distinguish Scottish SME crisis experiences from those documented in other national contexts (Brown & Rocha, 2020). The route map

implementation, business support schemes, and institutional engagement approaches created distinctive crisis management environments that may have enabled different patterns of capability development and transformation than those observed in less institutionally supported contexts. These regional institutional factors appear crucial for interpreting SME crisis management capabilities, as institutional support quality and accessibility may significantly affect the mechanisms through which SMEs develop crisis management capabilities and achieve transformation through adversity exposure.

Regional innovation system theory suggests that crisis management effectiveness may depend not only on individual SME characteristics but also on ecosystem-level capabilities including institutional support quality, network relationship density, and collaborative learning mechanisms that enable collective crisis response development (Asheim & Gertler, 2005). The Scottish context provides particular opportunities for investigating these ecosystem-level factors through examination of how institutional relationships affect individual SME crisis management approaches whilst contributing to broader regional resilience development.

Cultural factors within Scottish entrepreneurial ecosystems may also influence crisis management approaches through attitudes toward risk, collaboration, and institutional engagement that reflect broader cultural values and historical experiences (Anderson et al., 2012). Understanding these cultural dimensions appears important for interpreting crisis management patterns whilst recognising that regional context may significantly shape the mechanisms through which universal crisis management processes operate in specific geographical and institutional settings.

The implications for crisis management research include recognition that SME crisis management cannot be understood purely through individual organisational analysis but requires consideration of regional institutional and cultural contexts that shape available resources, relationship patterns, and strategic options during crisis periods. This regional perspective suggests that crisis management capability development may be partially contingent on ecosystem characteristics that enable or constrain individual SME development trajectories.

Entrepreneurial Orientation and Adaptive Advantages

SMEs possess structural characteristics that can provide adaptive advantages during crisis periods, particularly their entrepreneurial orientation, structural flexibility, and rapid decision-making capabilities (Davidsson et al., 2020; Shane & Venkataraman, 2000). Entrepreneurial orientation, characterised by risk-taking propensity, innovation focus, and proactive market engagement, enables SMEs to identify and exploit opportunities created by environmental disruption more rapidly than larger organisations constrained by bureaucratic procedures and risk-averse cultures (Miller, 1983; Covin & Slevin, 1991). Structural flexibility represents a key SME advantage during crisis periods, with flat organisational hierarchies, informal communication channels, and minimal bureaucratic procedures enabling rapid adaptation to changing conditions (Mintzberg, 1979). This flexibility contrasts sharply with large organisational contexts where crisis responses must navigate complex approval processes, coordinated implementation across multiple departments, and alignment with established policies and procedures that may be inappropriate for crisis conditions.

Additionally, rapid decision-making capabilities emerge from concentrated ownership and management structures that eliminate many of the coordination challenges facing larger organisations during crisis periods (Eisenhardt, 1989). Owner-managers can make strategic decisions quickly without extensive consultation or approval processes, enabling SMEs to respond to crisis developments more rapidly than larger organisations. This decision-making speed can provide crucial advantages during crisis periods when environmental conditions change rapidly, and delayed responses can result in missed opportunities or increased vulnerability.

Empirical research on SME crisis management has revealed several important patterns whilst highlighting significant gaps in understanding, particularly regarding the mechanisms through which SMEs develop crisis management capabilities and the conditions under which crisis exposure leads to organisational enhancement rather than simple survival (Herbane, 2019; Doern et al., 2019). Early SME crisis research focused primarily on vulnerability assessment and survival factors, with studies examining how resource constraints, market position, and industry characteristics affect SME survival rates during economic downturns and external shocks (Smallbone et al., 2012; Lee et al., 2010).

Herbane's (2010) comprehensive review of SME crisis management identified several key themes including the reactive nature of SME crisis responses, limited investment in formal crisis planning, heavy reliance on personal networks and informal support systems, and significant variation in crisis outcomes based on owner-manager characteristics and organisational capabilities. These findings established SMEs as particularly vulnerable to external shocks whilst highlighting their capacity for informal adaptation and network-based resource mobilisation. Subsequent research has examined specific crisis types and their impact on SME operations, with studies of economic crises (Cowling et al., 2015), natural disasters (Runyan, 2006), and supply chain disruptions (Thun & Hoenig, 2011) revealing how different crisis characteristics interact with SME structural features to create varying patterns of vulnerability and adaptation. These studies have consistently found that SME crisis management success depends heavily on owner-manager capabilities, pre-crisis resource positions, and access to external support systems rather than formal crisis management procedures.

The COVID-19 pandemic has generated unprecedented research interest in SME crisis management, with studies documenting both the severe challenges facing SMEs and their remarkable capacity for rapid adaptation and innovation under extreme constraints (Kraus et al., 2020; Kuckertz et al., 2020). This research has revealed several important findings including the crucial role of digital capabilities (mentioned earlier in the chapter) in enabling crisis adaptation, the importance of business model flexibility for survival under changing market conditions, and the potential for crisis-driven innovation and transformation that exceeds pre-crisis organisational performance.

However, significant gaps remain in SME crisis management research, particularly regarding the temporal dynamics of crisis management capability development, the mechanisms through which some SMEs achieve transformation rather than mere survival, and the conditions that enable sustained crisis management effectiveness across multiple crisis episodes. Most existing research examines SME crisis responses through cross-sectional studies or short-term longitudinal analysis that cannot capture the complex learning and adaptation processes that enable crisis management capability development over extended periods.

High-Growth SMEs: Distinctive Characteristics and Crisis Management Implications

High-growth SMEs represent a distinct subset of small enterprises characterised by growth orientation, innovation focus, and strategic ambition that create unique crisis management requirements and capabilities that differ substantially from survival-oriented or lifestyle enterprises (Davidsson et al., 2020; Coad et al., 2014). Unlike traditional SMEs that prioritise stability and risk minimisation, high-growth enterprises actively seek opportunities for expansion and development, creating fundamentally different relationships with uncertainty and volatility that may enhance their crisis management approaches rather than simply constraining them (Delmar et al., 2003; Autio et al., 2000).

The growth orientation of these enterprises creates what Davidsson et al. (2020) characterise as "growth mindset" that treats uncertainty as opportunity source rather than threat to be managed, fundamentally altering how these organisations perceive and respond to crisis conditions. This orientation manifests through several distinctive characteristics including aggressive opportunity recognition during market disruption, willingness to invest resources in uncertain outcomes, and systematic experimentation with new business models and strategic approaches during environmental turbulence (Shane & Venkataraman, 2000; Alvarez & Barney, 2007).

Research on high-growth SMEs reveals several characteristics that distinguish them from general SME populations in ways that appear particularly relevant for crisis management effectiveness. Innovation capabilities represent a core distinguishing factor, with high-growth enterprises typically possessing enhanced capacity for product development, process innovation, and business model experimentation that can be rapidly deployed during crisis conditions (Coad et al., 2014; Stam & Wennberg, 2009). These innovation capabilities often include technological infrastructure, experimental mindsets, and organisational cultures that normalise change and adaptation, creating foundations for rapid crisis response that exceed those available to less innovation-oriented enterprises.

Strategic ambition represents another crucial distinguishing characteristic, with high-growth SMEs maintaining longer-term development objectives even during crisis periods that might force other enterprises to focus exclusively on immediate survival (Delmar et al., 2003). This

strategic ambition creates willingness to accept short-term costs and risks in pursuit of longer-term competitive positioning that may enable these enterprises to pursue transformative crisis responses rather than purely defensive adaptations. The maintenance of strategic ambition during crisis periods may explain why some SMEs achieve enhancement through crisis exposure whilst others struggle with basic survival under similar conditions.

Risk tolerance and opportunity recognition capabilities appear particularly important for understanding how high-growth SMEs navigate crisis conditions, with research suggesting that these enterprises possess enhanced capacity for identifying and exploiting opportunities created by environmental disruption (Autio et al., 2000; Shepherd et al., 2015). Unlike risk-averse enterprises that focus primarily on threat protection during crisis periods, high-growth SMEs may actively seek crisis-created opportunities whilst simultaneously managing survival requirements. This dual focus on opportunity and threat management may require sophisticated crisis management capabilities that enable these enterprises to balance exploration and exploitation activities under resource constraints.

Network development and resource acquisition capabilities represent additional distinguishing factors that affect crisis management effectiveness, with high-growth SMEs typically possessing enhanced capacity for developing stakeholder relationships and accessing external resources during challenging periods (Wiklund et al., 2003; Baum et al., 2001). These capabilities often include reputation for reliability and growth potential that enhances stakeholder confidence, systematic approaches to partnership development that create resource access options, and relationship management skills that enable collaborative problem-solving during crisis periods.

However, high-growth SMEs also face distinctive crisis management challenges that stem from their growth orientation and strategic ambitions. Resource constraints may be particularly severe for high-growth enterprises that have invested heavily in expansion activities, leaving limited reserves for crisis management (Coad et al., 2014). Growth commitments including staff hiring, infrastructure development, and market expansion initiatives may create fixed costs that amplify crisis vulnerability whilst limiting strategic flexibility. The pressure to maintain growth trajectories may create decision-making complexity during crisis periods when survival requirements conflict with growth objectives.

The distinction between high-growth and general SME populations has important implications for crisis management research and practice, suggesting that frameworks developed for general SME populations may not adequately capture the distinctive characteristics and capabilities of growth-oriented enterprises. Understanding these distinctions appears crucial for developing theoretical frameworks that can account for the variation in SME crisis outcomes whilst providing practical guidance for enterprises with different strategic orientations and resource positions.

The distinction between high-growth and general SME populations has important implications for crisis management theory development, suggesting that frameworks developed for general SME populations may systematically underestimate the transformation potential of growth-oriented enterprises. This distinction challenges assumptions about SME homogeneity whilst highlighting the need for contingent theoretical frameworks that account for strategic orientation differences in crisis management capability development.

Effectuation Theory and Entrepreneurial Logic under Uncertainty

Effectuation theory, developed by Sarasvathy (2001, 2008), represents a fundamental departure from traditional strategic management logic by proposing that effective uncertainty navigation emerges through means-driven action rather than goal-oriented planning, challenging conventional assumptions about optimal strategic development under uncertain conditions. The theory originated from empirical observation of expert entrepreneurs who demonstrated systematic approaches to uncertainty navigation that contradicted traditional business school teaching about comprehensive planning, market analysis, and risk management as prerequisites for strategic success (Sarasvathy, 2001). Instead, effectuation principles emphasise leveraging available means, managing affordable loss, developing strategic partnerships, and exploiting contingencies as core mechanisms for creating value under uncertainty.

Effectuation theory provides important insights into how entrepreneurs navigate uncertainty through means-driven action rather than goal-driven planning, offering valuable frameworks for understanding SME crisis management approaches during periods when traditional

strategic planning becomes inadequate due to environmental unpredictability and resource constraints (Sarasvathy, 2001, 2008; Read et al., 2016). During crisis conditions characterised by high uncertainty, limited information, and rapid environmental change, effectuation principles may become particularly relevant for understanding how SMEs adapt and respond effectively despite lacking advanced planning capabilities or extensive resource reserves. The below figure 2.2 represents the visual overview of the theory of effectuation.

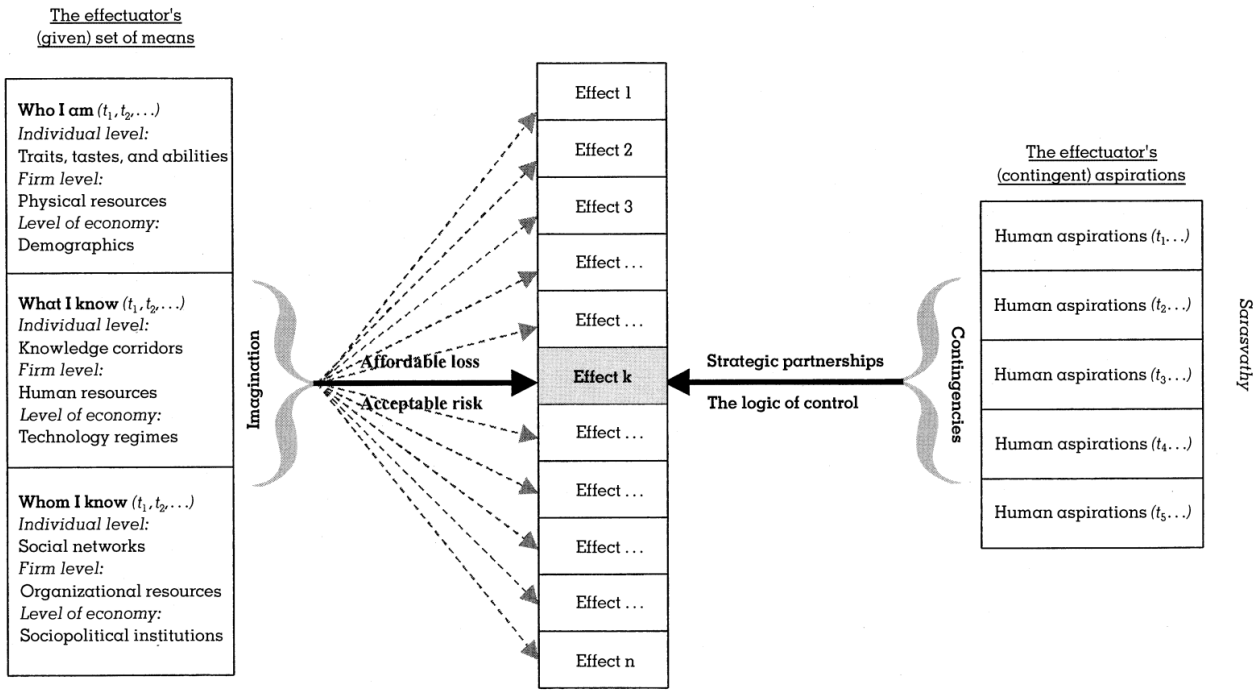


Figure 2.2 - The Theory of Effectuation. Reproduced from Sarasvathy, 2001, p. 253

The bird-in-hand principle directs attention to available means including personal capabilities, knowledge resources, and network relationships rather than focusing on optimal resource requirements for predetermined goals (Sarasvathy, 2001). This principal challenges resource-based strategy assumptions about resource acquisition as strategic priority, instead suggesting that creative deployment of existing resources may provide superior strategic development capability, particularly under resource constraints that characterise SME contexts. The principle implies that strategic effectiveness may depend more on cognitive capability to identify novel applications for available resources than on financial capability to acquire optimal resource configurations.

Affordable loss frameworks provide decision-making guidance when traditional cost-benefit analysis becomes impractical due to outcome uncertainty and limited ability to predict consequences of strategic choices (Sarasvathy, 2001; Dew et al., 2009). Rather than focusing on potential returns or probability-weighted outcomes, affordable loss logic evaluates strategic options based on acceptable loss levels that preserve organisational viability regardless of specific outcomes. This approach enables strategic action when prediction becomes impossible whilst maintaining organisational sustainability through risk limitation rather than risk optimisation.

Strategic partnerships under effectuation logic emphasise stakeholder commitment development rather than competitive positioning or market share capture (Sarasvathy, 2008; Harmeling et al., 2009). Effectual partnerships involve collaborative value creation through resource sharing, capability integration, and mutual commitment development that creates interdependencies benefiting all participants. This approach contrasts with traditional strategic alliance frameworks that emphasise competitive advantage creation through partner resource exploitation or market access enhancement, instead focusing on collaborative ecosystem development that enhances collective capability for uncertainty navigation.

Leveraging contingencies represents the most distinctive effectuation principle, treating unexpected events and environmental surprises as strategic opportunities rather than disruptions requiring defensive response (Read et al., 2009). This principle requires cognitive flexibility to recognise opportunity potential in unexpected developments whilst maintaining strategic coherence that enables rapid adaptation and creative response. The capability to leverage contingencies appears particularly valuable during crisis periods when environmental volatility creates numerous unexpected developments that may represent either threats or opportunities depending on interpretive and adaptive capability.

In other words, effectuation theory provides crucial frameworks for SME uncertainty navigation precisely because it emerged from studying resource-constrained entrepreneurs rather than well-resourced corporations. Sarasvathy's (2001, 2008) means-driven logic directly addresses the resource limitations that define SME contexts, offering strategic approaches that leverage constraint rather than requiring abundance. This alignment

between effectuation assumptions and SME realities suggests particular relevance for understanding how resource-constrained enterprises can achieve strategic effectiveness during uncertainty periods.

Means-driven adaptation under uncertainty represents a core effectuation principle that appears particularly relevant for SME crisis management, enabling enterprises to leverage available resources creatively rather than waiting for optimal resource positions or comprehensive planning completion (Sarasvathy, 2001; Perry et al., 2012). This approach involves systematic assessment of available means including personal capabilities, knowledge resources, and network relationships, followed by creative experimentation to identify viable applications for crisis response. Means-driven adaptation may enable SMEs to respond rapidly to crisis conditions whilst avoiding paralysis that can result from extensive planning attempts under uncertain conditions.

This is where the affordable loss frameworks provide important decision-making guidance for crisis conditions when traditional cost-benefit analysis becomes impractical due to uncertainty about outcomes and limited ability to predict consequences of different strategic choices (Sarasvathy, 2001; Brettel et al., 2012). Affordable loss logic involves evaluating strategic options based on acceptable loss levels rather than expected returns, enabling decision-making when outcome prediction becomes impossible, but action remains necessary for organisational survival. This approach may be particularly valuable for SMEs facing existential crisis conditions where traditional planning approaches become inappropriate but decisive action remains crucial for survival.

Furthermore, this is where strategic partnerships during resource constraints represent another effectuation principle with particular relevance for SME crisis management, enabling enterprises to access resources and capabilities through collaborative relationships rather than individual resource accumulation (Sarasvathy, 2008; Harmeling et al., 2009). Crisis conditions often create mutual interdependencies between organisations facing similar challenges, creating opportunities for collaborative resource sharing and mutual support that may not be available under normal competitive conditions. Effectuation's emphasis on stakeholder partnership development may provide frameworks for identifying and developing these collaborative opportunities during crisis periods.

Leveraging contingencies represents an effectuation principle that may be particularly valuable during crisis periods when unexpected events and emergent opportunities require rapid response and creative adaptation (Read et al., 2009; Reymen et al., 2015). Rather than treating unexpected developments as disruptions to planned strategies, effectuation approaches treat contingencies as potential opportunities for strategic advantage creation through rapid adaptation and creative response. This perspective may enable SMEs to identify crisis-created opportunities that might be missed through defensive crisis management approaches focused primarily on damage limitation.

However, empirical research on effectuation applications during crisis periods remains limited, with most effectuation studies focusing on new venture creation and growth contexts rather than crisis management situations (Fisher, 2012; Guo et al., 2016). The COVID-19 pandemic has provided opportunities for observing effectuation logic in crisis contexts, but systematic research on these applications has only recently begun to emerge. Understanding how effectuation principles apply during crisis conditions could provide valuable insights for both SME practitioners and crisis management researchers seeking to understand adaptive approaches to uncertainty navigation.

Effectuation in Crisis and Uncertainty Navigation

Crisis management applications of effectuation theory have revealed its particular relevance for uncertainty navigation when traditional planning approaches become inadequate due to environmental volatility, information limitations, and time pressures that characterise crisis conditions (McKelvie et al., 2011; Reymen et al., 2015). Crisis effectuation involves systematic application of effectuation principles to navigate extreme uncertainty whilst maintaining organisational viability and strategic development capability through experimental learning and adaptive response rather than comprehensive planning and implementation.

Available means assessment during crisis conditions often reveals hidden organisational capabilities and resource applications that may not be apparent under normal operating conditions (Baker & Nelson, 2005). Crisis pressure can stimulate creative thinking about resource utilisation whilst forcing systematic evaluation of all available capabilities, knowledge resources, and stakeholder relationships. This comprehensive means assessment

may identify novel strategic opportunities whilst revealing organisational strengths that provide foundation for crisis response and strategic development.

Affordable loss frameworks become particularly relevant during crisis periods when outcome prediction becomes extremely difficult whilst organisational survival depends on avoiding catastrophic losses that could eliminate strategic options (McGrath, 1999; Dew et al., 2009). Crisis applications of affordable loss often involve portfolio approaches that pursue multiple low-risk experiments rather than concentrated high-risk strategies, enabling learning and adaptation whilst preserving organisational viability. This approach may be particularly suitable for SMEs with limited resources that cannot afford major strategic failures.

Partnership development during crisis conditions can create mutual support systems that enhance collective capability for uncertainty navigation whilst reducing individual organisational risk through resource sharing and collaborative problem-solving (Harmeling et al., 2009; Reymen et al., 2015). Crisis partnerships often emerge rapidly through mutual recognition of interdependence and shared challenges, creating collaborative relationships that may not develop under normal competitive conditions. These partnerships can provide access to resources, capabilities, and market intelligence that exceed individual organisational capacity whilst creating social capital that supports ongoing strategic development.

Contingency leverage during crisis periods requires cognitive capability to recognise opportunity potential in crisis-created environmental changes, regulatory modifications, and stakeholder behaviour adaptations (Read et al., 2009). Crisis conditions often create market gaps, customer need changes, and competitive disruptions that represent strategic opportunities for organisations capable of rapid adaptation and creative response. However, contingency leverage also requires organisational agility and resource availability that may be constrained during crisis periods, creating tension between opportunity recognition and capability limitation.

Recent research on effectuation during the COVID-19 pandemic has provided unprecedented insights into crisis applications whilst revealing both the potential and limitations of effectuation approaches under extreme uncertainty (Kuckertz et al., 2020; Davidsson et al., 2022). The pandemic created conditions that favoured effectuation logic through

environmental unpredictability, resource constraints, and regulatory uncertainty that made traditional planning approaches impractical. However, the pandemic also revealed the importance of digital capabilities, stakeholder relationship quality, and adaptive capacity that may require development prior to crisis onset rather than during crisis navigation.

Digital Age Effectuation and Virtual Uncertainty Navigation

The digital transformation of business environments has created new contexts for effectuation application whilst modifying traditional effectuation mechanisms through enhanced connectivity, virtual collaboration capabilities, and digital resource access that alter the nature of available means, partnership development, and contingency recognition (Nambisan, 2017; Autio et al., 2018). Digital effectuation involves leveraging digital technologies and virtual capabilities as core means whilst developing online partnerships and exploiting digital contingencies for value creation under uncertainty.

Digital means expansion includes access to cloud computing resources, digital platforms, online marketing capabilities, and virtual collaboration tools that reduce traditional resource requirements for strategic development whilst enabling rapid experimentation and scaling (Nambisan, 2017). Digital resources often exhibit characteristics that enhance effectuation effectiveness including low marginal costs, network effects, and rapid deployment capability that enable experimental learning whilst maintaining affordable loss constraints.

Virtual partnership development through digital platforms, online communities, and collaborative networks can accelerate stakeholder relationship formation whilst enabling global resource access that transcends geographical limitations (Autio et al., 2018). Digital partnerships often emerge through virtual interaction and collaborative value creation rather than formal alliance negotiations, enabling rapid relationship development and resource sharing that supports effectuation approaches. However, virtual partnerships may also lack the trust and commitment depth that characterises traditional effectual relationships, requiring new approaches to relationship development and maintenance.

Digital contingency recognition involves monitoring online trends, social media signals, and digital platform developments that may reveal emerging opportunities or environmental

changes requiring adaptive response (Nambisan, 2017). Digital environments often generate rapid feedback and real-time information that can enhance contingency recognition capability whilst enabling rapid response to environmental changes. However, digital information overload and algorithmic filtering may also constrain contingency recognition by limiting exposure to unexpected information or creating confirmation bias that reinforces existing interpretations.

The integration of effectuation logic with digital capabilities appears particularly relevant for contemporary uncertainty navigation, where digital transformation accelerates environmental change whilst providing tools for enhanced adaptive response (Kraus et al., 2020). Understanding how effectuation principles operate in digital environments may be crucial for developing contemporary frameworks for uncertainty navigation that leverage technological capabilities whilst maintaining entrepreneurial flexibility and adaptive capacity.

Organisational Resilience Theory

Foundations of Organisational Resilience

Organisational resilience emerged as a distinct theoretical construct in the early 2000s, drawing on ecological resilience concepts whilst adapting them to organisational contexts characterised by conscious strategy, learning capabilities, and stakeholder relationships (Holling, 1973; Gunderson & Holling, 2002). The foundational work by Holling (1973) in ecological systems established resilience as the capacity of systems to absorb disturbance whilst maintaining essential functions and structures, creating the theoretical foundation for organisational applications that emphasise adaptive capacity and system stability under stress. This ecological perspective has been extended to organisational contexts through examination of how enterprises maintain operational effectiveness and strategic coherence during environmental turbulence and external shocks.

Sutcliffe and Vogus (2003) provided seminal advancement in organisational resilience theory through their definition of resilience as “the maintenance of positive adjustment under challenging conditions” (p. 94), shifting focus from mere survival to positive adaptation during adversity. Their framework emphasises three core components of organisational resilience: *cognitive resilience involving sense-making and mental model adaptation; behavioural*

resilience encompassing response flexibility and *adaptive action*; and contextual resilience addressing environmental sensing and adaptive capacity. This multidimensional conceptualisation advanced understanding beyond simple damage resistance to encompass adaptive learning and positive adjustment during challenging conditions.

Early organisational resilience research focused primarily on "engineering resilience" the term that describes the capacity to return to pre-disturbance states through resistance and recovery mechanisms (Holling, 1996). This perspective, reflected in works by Weick and Sutcliffe (2001) on high-reliability organisations and Comfort et al. (1999) on organisational adaptation, emphasised the development of robust systems, redundant capabilities, and standardised procedures that enable organisations to maintain functioning during disruption periods and recover quickly to normal operations.

The engineering resilience perspective provided valuable insights into organisational design principles and crisis preparedness systems, particularly in high-risk industries such as nuclear power, aviation, and healthcare where failure can have catastrophic consequences (Roberts, 1990; Rochlin, 1996). However, this perspective maintained the traditional crisis management assumption that optimal outcomes involve minimising disruption and returning to pre-crisis states, limiting its applicability to organisational contexts where transformation and adaptation represent viable strategic responses to environmental change.

Nonetheless, the resilience literature maintains fundamental limitations through its emphasis on recovery and return to stable functioning rather than transformation or enhancement through adversity exposure. Duchek's (2020) comprehensive review of organisational resilience literature reveals that resilience frameworks predominantly conceptualise successful adaptation as restoration of pre-crisis functioning rather than development of enhanced capabilities or improved strategic positioning. This recovery orientation limits consideration of how extreme conditions might enable organisational development that exceeds previous potential rather than simply restoring previous effectiveness.

Recognition of the limitations of engineering resilience led to development of more sophisticated resilience concepts that acknowledge the potential benefits of change and adaptation in response to environmental pressures (Folke, 2006; Walker et al., 2004).

Adaptive resilience focuses on organisational capacity to learn, adapt, and evolve in response to changing conditions rather than simply maintaining stability or returning to previous states (Lengnick-Hall et al., 2011). This perspective recognises that optimal organisational responses to environmental change may involve fundamental alterations to strategies, structures, and capabilities rather than defensive maintenance of existing arrangements.

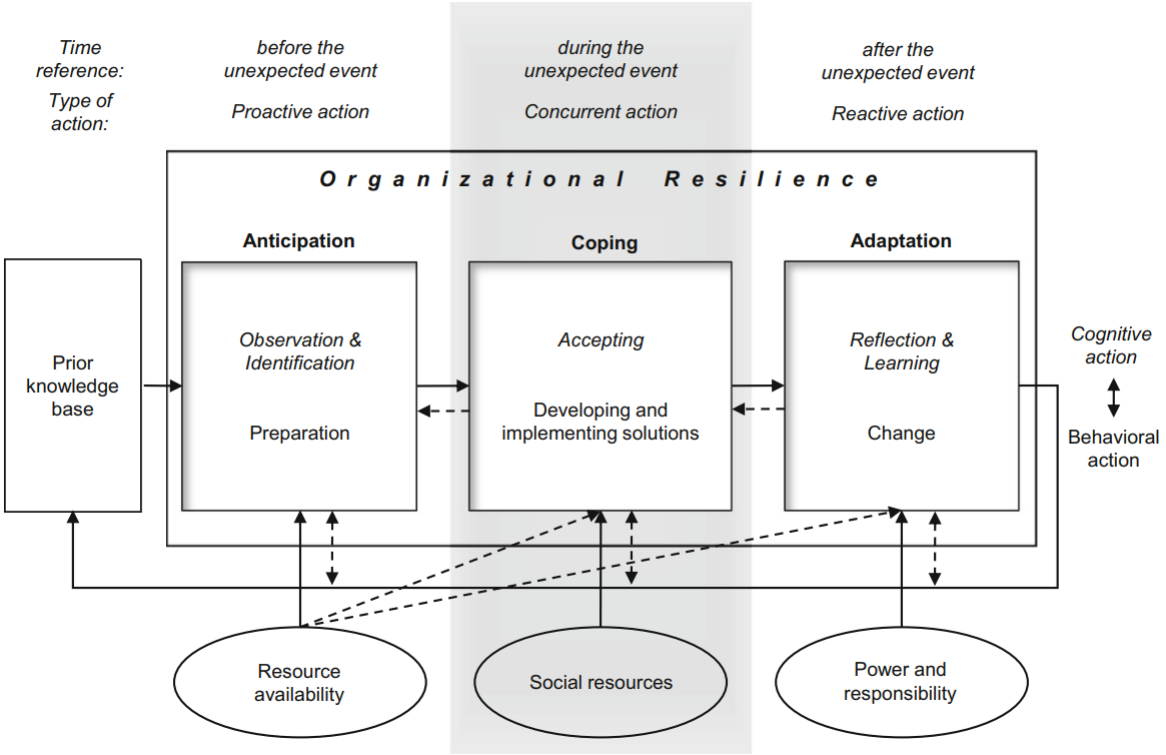
Lengnick-Hall et al.'s (2011) comprehensive framework identifies adaptive resilience as encompassing cognitive, behavioural, and contextual elements that enable organisations to "absorb strain, preserve functioning despite experiencing adversity, and recover and learn from adversity" (p. 244). Their framework emphasises the importance of learning and development through adversity exposure, suggesting that resilient organisations can emerge stronger from crisis experiences through enhanced capabilities and strategic positioning. Evolutionary resilience extends adaptive concepts to encompass fundamental transformation and renewal through crisis exposure, recognising that some environmental changes require organisational responses that transcend adaptation to encompass complete strategic and structural transformation (Folke et al., 2010). This perspective draws on complex adaptive systems theory to understand how organisations can undergo fundamental change whilst maintaining core identity and purpose, enabling renewal and regeneration rather than simple adaptation or recovery.

The evolutionary perspective introduces concepts such as "transformative capacity" and "adaptive cycles" that describe how organisations navigate periods of breakdown and renewal that can result in enhanced capabilities and competitive positioning (Gunderson & Holling, 2002; Walker et al., 2004). This perspective suggests that crisis periods can serve as opportunities for organisational development that would be difficult or impossible under normal operational conditions, challenging traditional assumptions about crisis as purely disruptive force.

Resilience Research and SME Applications

Present organisational resilience research has increasingly focused on dynamic capabilities and learning processes that enable sustained adaptation and development under uncertain conditions (Duchek, 2020; Burnard & Bhamra, 2019). Duchek's (2020) process model of organisational resilience identifies three stages: *anticipation* (crisis preparation and early

warning systems), *coping* (crisis response and immediate adaptation), and *adaptation* (learning and capability development for future resilience). This process perspective recognises resilience as dynamic capability that develops through sustained experience and learning rather than static organisational characteristic. A capability-based conceptualisation of organisational resilience by Duchek et al., (2020) is presented below.



Framework 2.3: A capability-based conceptualisation of organisational resilience. Reproduced from Duchek et al., 2020

Furthermore, Burnard and Bhamra's (2019) organisational resilience framework emphasises the importance of *absorptive capacity, adaptive capacity,* and *transformative capacity* as three core resilience dimensions that enable organisations to respond effectively to different types and magnitudes of environmental change. Their framework suggests that optimal resilience requires development of multiple capabilities that can be deployed selectively based on crisis characteristics and organisational circumstances.

Application of resilience concepts to SME contexts has revealed both the relevance and limitations of existing frameworks when applied to resource-constrained, entrepreneurial organisations (Williams et al., 2017; Battisti & Deakins, 2017). As SMEs' structural characteristics such as limited resources, flat hierarchies, and entrepreneurial orientation, create distinctive resilience patterns that differ from those observed in larger organisational contexts. SMEs may lack the resources for extensive crisis preparation systems but demonstrate remarkable capacity for rapid adaptation and innovation under pressure.

Williams et al.'s (2017) study of SME resilience during the 2008 financial crisis identified several distinctive patterns including heavy reliance on personal networks and informal support systems, rapid strategic adaptation based on market feedback, and significant variation in outcomes based on owner-manager characteristics and pre-crisis positioning. Their findings suggest that SME resilience depends heavily on entrepreneurial capabilities and social capital rather than formal organisational systems, highlighting the need for SME-specific resilience frameworks. However, current resilience research continues to exhibit several limitations when applied to SME contexts. Most frameworks emphasise stability and adaptation rather than transformation and enhancement, potentially underestimating SME capacity for crisis-driven development. Additionally, limited longitudinal research means that our understanding of how resilience capabilities develop over time remains incomplete, particularly regarding the mechanisms through which some SMEs achieve sustained competitive advantages through crisis exposure.

Temporal Dynamics of Crisis Management Capability Development

Existing crisis management research predominantly examines crisis responses through cross-sectional studies or short-term longitudinal analysis that cannot capture the complex learning and adaptation processes enabling sustained crisis management effectiveness across extended periods of uncertainty and stress (Williams et al., 2017; Herbane, 2019). This methodological limitation creates significant gaps in understanding how crisis management capabilities develop, interact, and compound over time, particularly regarding the mechanisms through which some organisations achieve transformation rather than mere survival through sustained crisis exposure.

The temporal dimension appears crucial for understanding crisis management as dynamic capability development process rather than static response repertoire, with initial crisis responses creating developmental trajectories that shape subsequent learning and adaptation processes (Zollo & Winter, 2002; Eisenhardt & Martin, 2000). Crisis learning accumulation processes may involve systematic integration of crisis experience with organisational knowledge systems that enhance decision-making capabilities and strategic development capacity for future crisis situations. However, research on these accumulation processes remains limited, creating uncertainty about the conditions and mechanisms enabling organisational learning and capability development through crisis experience.

Phase-based capability development models represent an emerging but underdeveloped area of crisis management research that examines how organisational capabilities evolve across distinct temporal phases during extended crisis periods (Duchek, 2020). Unlike traditional crisis management frameworks that treat crisis as discrete events with clear beginning and ending points, phase-based models recognise that extended crisis periods involve multiple developmental stages with different characteristics and requirements that enable progressive capability enhancement through accumulated learning and adaptive experience. This is something that this thesis attempts to do.

Preliminary research suggests that crisis phases may involve distinctive patterns of cognitive development, strategic adaptation, and capability integration that build upon previous learning whilst creating new challenges requiring enhanced organisational sophistication (Bapuji & Crossan, 2020; Argote & Miron-Spektor, 2011). Early crisis phases may involve cognitive disruption and framework reconstruction that creates foundations for subsequent adaptation, whilst later phases may involve strategic integration and enhancement that leverages accumulated learning for competitive advantage creation. However, systematic examination of these phase-based patterns remains limited.

Longitudinal versus cross-sectional research limitations represent a significant methodological challenge in crisis management research, with most studies examining crisis responses at single time points that cannot capture the dynamic processes underlying capability development and organisational transformation (Gehman et al., 2018; Langley et al., 2013). Cross-sectional studies may identify successful crisis management practices but

cannot explain how these practices developed or how they might be replicated in different organisational contexts. Similarly, short-term longitudinal studies may capture immediate adaptation processes but miss longer-term learning and capability development that enable sustained crisis management effectiveness.

Sustained crisis exposure effects represent a particularly important but underexplored dimension of temporal crisis management research, with limited understanding of how extended periods of uncertainty and stress affect organisational development, learning capacity, and strategic positioning over time (Taleb, 2012; Derbyshire, 2016). Some organisations may develop enhanced capabilities through sustained crisis exposure that enable them to extract value from uncertainty and volatility, whilst others may experience capability erosion and strategic deterioration under similar conditions. Understanding these differential responses requires temporal analysis that examines capability development trajectories across extended crisis periods.

Capability compounding and interaction effects may represent crucial mechanisms underlying temporal crisis management development, with individual crisis management capabilities potentially combining and reinforcing each other to create enhanced organisational effectiveness that exceeds the sum of individual capability contributions (Sirmon et al., 2011; Chadwick et al., 2015). For example, sense-making capabilities may enhance resource innovation effectiveness, whilst stakeholder relationship capabilities may amplify strategic development impact through collaborative learning and mutual value creation. However, research on these interaction effects remains limited.

The temporal perspective on crisis management capability development has important implications for both theoretical understanding and practical application, suggesting that effective crisis management may require long-term development approaches rather than simply immediate response preparation. Organisations seeking to enhance crisis management effectiveness may need to consider capability development as ongoing process rather than discrete training or planning activities, whilst researchers may need longitudinal methodological approaches that can capture the complex dynamics underlying organisational transformation through crisis experience.

Antifragility in Organisational Contexts: Beyond Resilience

Theoretical Foundations of Antifragility

The concept of antifragility, introduced by Nassim Nicholas Taleb (2012), represents a fundamental departure from traditional resilience thinking by proposing that some systems not only withstand stress and volatility but actually benefit from it, becoming stronger through exposure to adverse conditions. Taleb defines antifragility as "a property of systems that increase in capability, resilience, or robustness as a result of stressors, shocks, volatility, noise, mistakes, faults, attacks, or failures" (p. 3). This definition challenges the conventional assumption that optimal system design involves minimising exposure to uncertainty and volatility, instead suggesting that some level of stress exposure may be necessary for system development and enhancement.

Taleb's framework identifies several characteristics of antifragile systems including optionality (asymmetric payoff structures that provide upside potential with limited downside risk), redundancy and overcompensation (system responses that exceed what is necessary for stability), and evolutionary selection processes that strengthen beneficial characteristics whilst eliminating weaknesses. These characteristics suggest that antifragile development requires system design principles that enable learning and adaptation through stress exposure rather than stress avoidance.

The antifragility concept draws on evolutionary biology, complex systems theory, and empirical observations of how certain systems respond to stress exposure. Unlike fragile systems that break under stress or resilient systems that resist and recover from stress, antifragile systems use stress as information and energy source for adaptation and enhancement (Taleb, 2012). This perspective suggests that attempts to eliminate uncertainty and volatility may actually weaken systems by preventing the development of adaptive capabilities that can only emerge through challenge exposure.

Antifragility in Organisational Research

Translation of antifragility concepts to organisational contexts has generated significant theoretical interest whilst revealing the complexity of applying biological and systems

concepts to conscious, strategic organisations operating within competitive environments (Derbyshire, 2016; Ramezani & Camarinha-Matos, 2020). Organisational antifragility requires development of capabilities that enable organisations to extract value from uncertainty, volatility, and stress rather than simply surviving or adapting to challenging conditions.

Derbyshire's (2016) exploration of organisational antifragility identifies several key mechanisms through which organisations can develop antifragile characteristics including strategic experimentation under constraint, asymmetric risk management that provides unlimited upside with limited downside exposure, and evolutionary learning processes that strengthen organisational capabilities through selective pressure. His framework suggests that antifragile organisations actively seek exposure to moderate levels of stress and uncertainty as opportunities for capability development and competitive advantage creation.

However, organisational antifragility research faces several theoretical and empirical challenges. The voluntary and strategic nature of organisational behaviour creates complexities not presented in biological or physical systems, requiring examination of how conscious strategy and learning processes affect antifragile development. Additionally, organisational antifragility must be evaluated within competitive contexts where one organisation's advantage may come at the expense of others, raising questions about the sustainability and generalisability of antifragile characteristics.

Ramezani and Camarinha-Matos (2020) examine collaborative networks' antifragile properties, proposing that some organisational arrangements can develop enhanced capabilities through disruption exposure whilst maintaining cooperative relationships and mutual benefit creation. Their work suggests that antifragile development may be particularly relevant in network contexts where organisations can share risks whilst capitalising on diverse learning and adaptation capabilities.

COVID-19 and Organisational Antifragility

The COVID-19 pandemic has provided an unprecedented natural experiment for observing organisational antifragility in action, with some organisations demonstrating remarkable enhancement through crisis exposure whilst others struggled with basic survival (Kraus et al.,

2020; Kuckertz et al., 2020). The pandemic's global scope, extended duration, and simultaneous impact across multiple sectors have created conditions that enabled observation of organisational antifragile development in real-world settings.

Research on SME responses to COVID-19 has documented numerous examples of organisations that achieved significant enhancement through crisis exposure, including rapid digital transformation that accelerated capability development, business model innovation that created new revenue streams and competitive advantages, and stakeholder relationship development that provided enhanced strategic positioning (Papadopoulos et al., 2020; Kraus et al., 2020). These observations suggest that some SMEs possess or can develop antifragile characteristics that enable them to extract strategic value from crisis conditions.

Kuckertz et al.'s (2020) examination of crisis entrepreneurship during COVID-19 identifies several mechanisms through which entrepreneurial organisations can achieve antifragile development including opportunity recognition in crisis-created market gaps, resource recombination that creates novel solutions under constraint conditions, and stakeholder value creation that builds sustainable competitive advantages during uncertainty periods. Their findings suggest that entrepreneurial orientation and innovative capability may be particularly important for antifragile development in SME contexts.

However, empirical research on organisational antifragility remains limited, with most studies providing descriptive accounts of enhanced performance during crisis periods rather than systematic analysis of the mechanisms underlying antifragile development. Additionally, questions remain about the conditions that enable antifragile development, the sustainability of crisis-driven enhancements, and the generalisability of antifragile characteristics across different organisational and environmental contexts.

Stakeholder Engagement During Crisis

Research on crisis management literature predominantly emphasises operational continuity, financial resilience, and strategic adaptation whilst treating stakeholder engagement as constraints requiring management rather than strategic resources enabling competitive advantage creation (Bundy et al., 2017; Williams et al., 2017). This perspective systematically

underestimates the strategic potential of authentic stakeholder engagement whilst missing opportunities to understand how crisis conditions can accelerate relationship development and formation that creates lasting competitive advantages beyond crisis-specific applications (Gartenberg et al., 2019; Kapoor & Lee, 2013).

Furthermore, the COVID-19 pandemic has provided unprecedented insights into values-based crisis management and collaborative responses that challenge traditional assumptions about competitive advantage creation whilst revealing new patterns of stakeholder engagement under extreme uncertainty (Kuckertz et al., 2020; Kraus et al., 2022). Crisis periods may create distinctive contexts where values authenticity and stakeholder commitment become more rather than less important for strategic effectiveness, contradicting assumptions that ethical considerations become secondary during survival periods (Adam & Alarifi, 2021). This way, crisis conditions create distinctive contexts for stakeholder engagement that may either accelerate relationship development through shared challenges and mutual dependencies or constrain stakeholder attention through survival pressures and resource limitations (Bundy et al., 2017; Coombs, 2019). Where understanding how crisis conditions affect stakeholder relationship dynamics appears crucial for developing crisis management capabilities.

Crisis as Stakeholder Relationship Catalyst

Crisis conditions fundamentally alter stakeholder relationship dynamics in three specific ways that existing theory inadequately captures. First, crisis can create temporal compressions where relationship development that normally requires months or years occurs within weeks through shared urgency and mutual vulnerability (Comfort, 2007). SMEs often report developing closer stakeholder relationships during COVID-19 than they had achieved through years of normal business interaction.

Second, crisis can potentially enable authentic revelation, where stakeholders observe organisational character under pressure, providing credibility tests that normal conditions cannot replicate (Bundy et al., 2017). This creates opportunities for trust development that marketing or formal stakeholder engagement cannot achieve. Third, crisis generates a form of collaborative necessity where traditional competitive boundaries become counterproductive, enabling resource sharing and information exchange that competitive

conditions normally prevent (Kapucu & Demiroz, 2017). Many SMEs discovered collaborative opportunities during COVID-19 that competitive mindsets had previously obscured.

Empirical research documents a crisis collaboration form, where stakeholder groups that rarely cooperate under normal conditions develop intensive collaborative relationships during crisis periods through recognition of shared vulnerability and mutual benefit potential (Comfort, 2007). These emergency collaborations often demonstrate collective capabilities that exceed individual organisational capacity whilst creating social capital and trust that supports ongoing relationship development beyond crisis periods. However, crisis-driven stakeholder collaboration may also create unrealistic expectations about ongoing relationship potential whilst establishing collaboration patterns that prove unsustainable under normal competitive conditions (Quarantelli, 1998). The intensity and urgency of crisis collaboration may mask fundamental interest conflicts that resurface when immediate crisis pressures subside, creating relationship disappointment and trust erosion that may damage rather than enhance long-term stakeholder relationships.

Effective crisis stakeholder management requires developing frameworks for expectation management that maintain stakeholder confidence whilst establishing realistic boundaries about organisational capability and commitment levels during crisis periods (Bundy et al., 2017). These frameworks must balance stakeholder support with organisational sustainability whilst communicating uncertainty and limitation in ways that maintain rather than undermine stakeholder confidence and collaborative potential.

It is also worth mentioning that crisis periods create temptations for opportunistic stakeholder engagement that seeks immediate benefits without authentic commitment whilst potentially damaging long-term relationship potential through manipulative or exploitative approaches (Orlitzky & Benjamin, 2001). Crisis urgency may encourage organisations to make stakeholder commitments that they cannot sustain whilst seeking stakeholder resources and support that exceed reciprocal value provision. Authentic stakeholder engagement during crisis requires frameworks that distinguish between genuine collaborative opportunity and opportunistic resource extraction whilst developing engagement approaches that create mutual value rather than one-sided benefit (Freeman et al., 2018). Authentic engagement typically involves long-term perspective that extends

beyond immediate crisis needs whilst recognising stakeholder contributions and interests that may not provide immediate organisational benefits.

Values-Based Crisis Management and Purpose-Driven Organisation

Values-based management emerged from recognition that organisational values and purpose can function as strategic capabilities rather than operational constraints, providing decision-making frameworks, stakeholder differentiation, and competitive positioning that transcend traditional resource-based or capability-based competitive advantages (Collins & Porras, 1994; George et al., 2016). The theoretical development originated from empirical observation that organisations with authentic values alignment often demonstrate superior long-term performance whilst attracting stakeholder loyalty and employee engagement that purely financial incentives cannot achieve (Kotter & Heskett, 1992; Gartenberg et al., 2019).

However, the values-performance relationship remains empirically ambiguous with studies revealing positive, neutral, and negative relationships depending on measurement approaches, temporal frameworks, and contextual conditions that existing theory cannot adequately explain (Orlitzky et al., 2003; Margolis & Walsh, 2003). The values implementation challenge involves translating abstract values statements into concrete decision-making criteria and operational procedures that provide practical guidance whilst maintaining values authenticity and strategic relevance.

For SMEs, values-based management takes on distinctive characteristics, as SME values typically reflect owner-manager personal values more directly than large corporation values, which often emerge through committee processes and stakeholder consultation (Spence & Rutherfoord, 2001). This creates both authenticity advantages such as stakeholders can assess values genuineness through direct interaction with decision-makers, as well as strategic constraints where values modification requires personal change rather than organisational policy revision. Especially during crisis periods, SME values authenticity faces particular tests. Unlike large corporations that can maintain values rhetoric whilst making operationally contradictory decisions through organisational complexity, SME stakeholders directly observe whether values claims match crisis behaviour (Quinn, 1997). This

transparency creates accountability that may constrain short-term opportunistic behaviour whilst building stakeholder trust that supports crisis survival and recovery.

Values as Cognitive Anchors During Uncertainty

Crisis conditions often create cognitive overload and decision-making paralysis through information ambiguity, stakeholder complexity, and temporal pressure that exceed normal decision-making capabilities whilst requiring rapid response despite incomplete understanding and uncertain outcomes (Weick, 1995; Maitlis & Christianson, 2014). Values frameworks may provide cognitive anchors that enable decision-making when analytical approaches prove inadequate whilst maintaining stakeholder confidence and internal coherence during uncertainty periods when traditional strategic frameworks become obsolete.

The cognitive anchor function of values appears particularly important during significant crisis period, where some fundamental assumptions about organisational reality may require reconstruction whilst demanding continued action despite interpretive breakdown (Weick, 1993). Values may provide interpretive stability that enables identity maintenance and decision-making continuity whilst facilitating framework reconstruction through value-guided experimentation and stakeholder engagement that purely analytical approaches cannot achieve. However, values-based cognitive anchoring may also create inflexibility and adaptation resistance that prevents necessary organisational change whilst constraining strategic innovation that crisis survival may require (Johnson, 1992).

Furthermore, crisis periods may create distinctive opportunities for ethical competitive advantages through stakeholder relationship development, reputation enhancement, and collaborative capability creation that opportunistic competitors cannot achieve whilst providing strategic positioning that transcends immediate crisis conditions (Freeman et al., 2018). Ethical behaviour during crisis may demonstrate organisational character whilst building stakeholder trust and loyalty that supports ongoing strategic development beyond crisis-specific applications.

Empirical research reveals distinct ethical crisis advantages, where organisations maintaining ethical commitments during crisis periods achieve superior stakeholder support, reputation resilience, and recovery capability compared to organisations pursuing purely opportunistic strategies (Coombs & Holladay, 2006). These advantages often emerge through stakeholder confidence in organisational reliability whilst creating collaborative opportunities and resource access that ethical reputation enables during crisis periods when stakeholder support becomes crucial for survival and recovery. However, ethical competitive advantages may also create performance costs and competitive disadvantages when competitors pursue opportunistic.

The values differentiation effect appears particularly important for SMEs that may lack resource-based competitive advantages whilst needing stakeholder loyalty and support that larger competitors might obtain through superior resource provision or strategic positioning (Miller & Le Breton-Miller, 2005). Values-based differentiation may enable SME competitive positioning through authentic stakeholder engagement whilst creating relationship resilience that supports crisis survival and strategic development despite resource constraints.

Theoretical Gaps and Research Opportunities

Integration Challenges in Crisis Management Literature

The review of crisis management and organisational resilience literature reveals several significant theoretical gaps that limit understanding of how organisations, particularly SMEs, develop effective crisis management capabilities and achieve transformation through adversity exposure. The first major gap concerns the fragmented nature of existing theoretical frameworks, with crisis management, resilience, and antifragility literatures developing largely independently despite addressing related phenomena (Bundy et al., 2017; Duchek, 2020).

Traditional crisis management literature emphasises reactive response and damage limitation without adequately considering how crisis experience might contribute to organisational development and capability enhancement (Pearson & Clair, 1998; Coombs, 2007). Resilience literature addresses adaptation and learning but typically focuses on stability maintenance rather than transformation and enhancement (Sutcliffe & Vogus, 2003; Lengnick-Hall et al.,

2011). Antifragility literature proposes transformation through adversity but lacks empirical validation and practical application frameworks (Taleb, 2012; Derbyshire, 2016).

This theoretical fragmentation creates challenges for researchers and practitioners seeking to understand the full spectrum of organisational responses to crisis conditions, from breakdown and failure through survival and recovery to adaptation and transformation. The lack of integration limits the ability to identify the conditions and mechanisms that determine why some organisations achieve transformation whilst others struggle with basic survival under similar crisis conditions.

A second major gap concerns the limited understanding of temporal dynamics in crisis management capability development, with most research examining crisis responses through cross-sectional studies or short-term longitudinal analysis that cannot capture the complex learning and adaptation processes that enable sustained crisis management effectiveness (Herbane, 2019; Williams et al., 2017). The temporal dimension appears crucial for understanding how crisis management capabilities develop, with initial crisis responses creating trajectories that shape subsequent learning and adaptation processes.

Existing research provides limited insight into how organisations develop crisis management capabilities through sustained exposure to uncertainty and stress, how these capabilities compound and interact over time, and how temporal learning processes enable enhanced organisational performance that exceeds pre-crisis potential. This gap is particularly pronounced in SME contexts, where resource constraints and structural flexibility create unique temporal patterns of capability development that may differ significantly from those observed in larger organisational contexts.

The COVID-19 pandemic has highlighted the importance of temporal analysis by demonstrating how organisations' crisis management capabilities evolved significantly over extended crisis periods, with some SMEs achieving remarkable transformation through sustained adaptation and learning processes. However, systematic longitudinal analysis of these temporal dynamics remains limited, creating opportunities for research that examines crisis management as dynamic capability development process rather than static response repertoire.

A third significant gap concerns the limited understanding of SME-specific crisis management mechanisms, with most existing frameworks developed and tested in larger organisational contexts that may not adequately capture the unique characteristics and capabilities of resource-constrained, entrepreneurial organisations (Davidsson et al., 2020; Herbane, 2010). SMEs' structural characteristics such as limited resources, flat hierarchies, entrepreneurial orientation, and rapid decision-making capabilities create distinctive patterns of crisis vulnerability and adaptive capacity that require specialised theoretical frameworks.

Existing SME crisis management research has documented survival factors and adaptation patterns but provides limited insight into the mechanisms through which some SMEs achieve transformation and competitive advantage creation through crisis exposure. The role of entrepreneurial orientation, informal networks, and resource innovation in enabling SME crisis management remains incompletely understood, particularly regarding how these factors interact with crisis characteristics to produce varying outcomes.

The COVID-19 pandemic has demonstrated that SMEs can achieve remarkable innovation and transformation under extreme constraint conditions, suggesting the existence of previously unrecognised crisis management capabilities that deserve systematic investigation. Understanding these mechanisms could provide valuable insights for both SME practitioners facing crisis conditions and policymakers designing support systems for crisis-affected enterprises.

A fourth theoretical gap concerns the role of values, ethics, and stakeholder relationships in crisis management, with existing literature typically treating these factors as constraints on crisis response rather than potential sources of strategic advantage (Coombs, 2007; Alpaslan et al., 2009). Traditional crisis management frameworks emphasise reputation protection and stakeholder damage control, potentially overlooking how authentic value expression and ethical consistency during crisis periods might create competitive advantages through stakeholder relationship development.

The assumption that crisis conditions require suspension of ethical considerations in favour of survival imperatives may be particularly inappropriate for SME contexts, where personal values, community relationships, and stakeholder trust often represent crucial strategic resources (Freeman et al., 2018). Understanding how values integration affects crisis

management effectiveness could provide important insights into sustainable crisis management approaches that create long-term strategic advantages rather than simply minimising short-term damage.

Research on stakeholder relationships during crisis periods remains limited, with most studies focusing on crisis communication and reputation management rather than examining how crisis conditions might enable enhanced stakeholder relationship development through collaborative problem-solving and mutual value creation. This gap represents a significant opportunity for research that examines crisis management as stakeholder value creation process rather than purely defensive activity.

Methodological Limitations in Crisis Management Research

The predominance of cross-sectional and retrospective research designs in crisis management literature creates significant methodological limitations that constrain theoretical development and prevent comprehensive understanding of crisis management as dynamic capability development process (Eisenhardt & Graebner, 2007; Gehman et al., 2018). Most SME crisis studies rely on post-crisis interviews and surveys that may suffer from retrospective bias, selective memory effects, and inability to capture the real-time sense-making processes occurring during crisis periods when interpretive frameworks are actively reconstructed, and strategic decisions emerge through experimental learning rather than predetermined planning.

This methodological limitation becomes particularly problematic for understanding temporal learning accumulation, where the mechanisms of capability development may only be observable through sustained real-time longitudinal analysis that captures cognitive development, strategic adaptation, and stakeholder relationship evolution as they occur rather than as they are retrospectively reconstructed (Langley et al., 2013). The dynamic nature of sense-making processes during crisis periods suggests that retrospective accounts may systematically underestimate the complexity and non-linearity of capability development whilst overemphasising coherent strategic narratives that emerge through post-hoc rationalisation.

The lack of process-focused longitudinal research creates what Van de Ven (2007) characterises as "variance theory dominance" that examines crisis outcomes without understanding the processes through which these outcomes emerge. This methodological orientation prevents understanding of how crisis management capabilities develop, interact, and compound over time, where precisely the mechanisms that appear crucial for explaining why some SMEs achieve transformation whilst others struggle with survival under similar external conditions. The emphasis on outcome measurement rather than process investigation limits theoretical development by treating crisis management as static capability rather than dynamic learning process. This methodological transfer may systematically misrepresent SME crisis management by emphasising formal systems and procedures that SMEs rarely possess whilst undervaluing informal adaptation and network-based approaches that represent core SME crisis management capabilities.

The COVID-19 pandemic provided unique opportunities for real-time longitudinal crisis management research, but most studies continued to rely on cross-sectional designs that captured crisis responses at single time points rather than tracking capability development across extended crisis periods (Cowling et al., 2020; Kraus et al., 2020). This represents missed opportunity for advancing theoretical understanding through process-focused investigation that could reveal the temporal dynamics of crisis management capability development in real-world settings.

These methodological limitations suggest the need for longitudinal process research designs that can capture crisis management as dynamic capability development process rather than static response repertoire. Such methodological approaches appear particularly important for investigating antifragile development mechanisms, temporal learning accumulation, and the conditions that enable transformation rather than mere survival through crisis exposure. As will be examined in Chapter three, the cognitive and strategic adaptation mechanisms underlying this transformation require integration of sense-making theory with resource innovation approaches to understand how SMEs navigate extreme uncertainty.

Values and Ethics in Crisis Management: An Underexplored Dimension

Value and ethics will be further extensively explored in the chapter four, but nonetheless, it is worth mentioning now that traditional crisis management literature treats ethical considerations as constraints on crisis response effectiveness, potentially overlooking how value-based decision-making might create competitive advantages through stakeholder relationship development and authentic strategic positioning (Freeman et al., 2018; George et al., 2016). This conceptual gap reflects broader assumptions in strategic management literature about trade-offs between ethical behaviour and competitive performance that may be particularly inappropriate for crisis contexts where stakeholder trust and collaborative relationships become crucial for survival and development.

The ethics versus effectiveness false contrast in crisis literature stems from early crisis management frameworks that emphasised rapid response and decisive action over stakeholder consultation and ethical deliberation (Quarantelli, 1988; Rosenthal et al., 1989). These frameworks assume that crisis conditions require suspension of normal ethical considerations in favour of decision-making focused on organisational survival and damage limitation. However, empirical evidence from recent crisis events suggests that enterprises maintaining consistent ethical approaches during crisis periods often achieve superior long-term outcomes through enhanced stakeholder relationships and competitive differentiation (Adam & Alarifi, 2021).

This is where the stakeholder trust represents a particularly important but underexplored strategic resource during crisis periods, when uncertainty increases dependence on collaborative relationships and mutual support systems (Jones et al., 2018; Parmar et al., 2010). Crisis conditions often reveal the true quality of stakeholder relationships, with enterprises that have invested in authentic value-based relationships receiving enhanced support during challenging periods whilst those focused purely on transactional relationships experiencing stakeholder abandonment when support becomes most crucial. This pattern suggests that values-based stakeholder relationship development may represent strategic investment rather than constraint on crisis management effectiveness.

Community-based crisis management approaches represent an emerging area of research that examines how enterprises integrate community value creation with crisis response strategies, revealing opportunities for mutual benefit creation that enhance both organisational and community resilience (Kapoor & Lee, 2013; Adner, 2017). SMEs embedded within local communities often possess unique opportunities for values-based crisis management through local stakeholder support, community resource sharing, and collaborative problem-solving that creates competitive advantages whilst contributing to broader community resilience. These approaches challenge individualistic assumptions in traditional crisis management frameworks by demonstrating how collaborative values-based approaches can enhance rather than constrain crisis management effectiveness.

The tension between long-term value creation and short-term survival imperatives represents a crucial but underexplored dimension of values-based crisis management, with enterprises facing decisions about resource allocation, stakeholder commitment, and strategic positioning that have both immediate survival implications and long-term competitive consequences (Bebchuk & Tallarita, 2020; Schaltegger et al., 2016).

This gap in understanding values-based crisis management represents significant opportunity for research that examines how ethical frameworks function as strategic resources rather than constraints during crisis periods, particularly in SME contexts where personal values and community relationships often represent crucial competitive advantages. Such research could provide important insights into sustainable crisis management approaches that create long-term strategic value whilst addressing immediate survival challenges.

Conclusion

The evolution of crisis management theory from reactive disaster response to sophisticated multi-dimensional frameworks demonstrates substantial theoretical advancement, yet significant gaps remain in understanding how SMEs develop crisis management capabilities that enable transformation rather than mere survival. The persistent emphasis on recovery over transformation, limited temporal analysis of capability development, and inadequate SME-specific frameworks create opportunities for theoretical development that addresses these limitations whilst building on valuable insights from existing research. The evolution from reactive disaster management through strategic crisis management to modern

resilience and antifragility concepts demonstrates increasing recognition of organisational capacity for adaptation and learning under challenging conditions.

However, the review also reveals the limitations of existing frameworks when applied to SME contexts characterised by resource constraints, entrepreneurial orientation, and structural flexibility that create unique patterns of crisis vulnerability and adaptive capacity. The COVID-19 pandemic has highlighted these limitations whilst providing unique opportunities for observing organisational antifragile development in real-world settings, suggesting the need for new theoretical frameworks that can account for the full spectrum of organisational responses to crisis conditions.

The theoretical gaps identified as fragmented frameworks, limited temporal analysis, inadequate SME-specific understanding, and underexplored value integration, overall represent significant opportunities for research that advances both theoretical understanding and practical effectiveness of crisis management in SME contexts. The emergence of antifragility concepts provides a promising foundation for this research, but empirical validation and mechanism identification remain crucial for translating theoretical insights into practical applications.

The review establishes the foundation for examining how high-growth SMEs develop crisis management capabilities through sustained exposure to uncertainty and stress, with particular attention to the temporal dynamics of capability development, the role of values and stakeholder relationships in crisis management effectiveness, and the conditions that enable transformation rather than simple survival. This foundation supports investigation of crisis management as dynamic capability development process that can enable organisational enhancement through adversity exposure, challenging traditional assumptions about crisis as purely disruptive force whilst building on valuable insights from existing crisis management and resilience research. The following chapters establish the cognitive, strategic, and collaborative frameworks necessary for understanding how these enterprises develop complex crisis management capabilities through sustained uncertainty exposure.

Chapter three: Literature review on Sense-Making and Adaptation under Uncertainty

Introduction

The ability of organisations to navigate extreme uncertainty has emerged as a critical determinant of strategic success in an increasingly volatile business environment, where traditional planning approaches often prove inadequate for addressing complex, rapidly evolving challenges (Eisenhardt & Martin, 2000; Teece, 2007). This capability becomes particularly crucial for small and medium-sized enterprises (SMEs) operating with limited resources and facing existential pressures during crisis periods, where the capacity to make sense of ambiguous conditions, adapt strategic approaches, and innovate with available resources can determine the difference between organisational failure and transformation (Sarasvathy, 2001; Baker & Nelson, 2005). The COVID-19 pandemic has provided unique insights into these processes, revealing how some organisations develop capabilities for uncertainty navigation that enable not merely survival but strategic enhancement through adversity exposure.

This chapter examines the existing literature and theoretical foundations underlying organisational responses to extreme uncertainty, focusing on three interconnected domains that emerged as crucial mechanisms in modern crisis management research. First, sense-making theory provides frameworks for understanding how organisations construct meaning from ambiguous and rapidly changing environmental conditions, enabling coherent action despite incomplete information and contradictory signals (Weick, 1995; Maitlis & Christianson, 2014). Second, strategic adaptation mechanisms reveal how enterprises modify their strategic approaches, business models, and operational configurations in response to environmental change whilst maintaining organisational coherence and competitive positioning (Mintzberg, 1994; Eisenhardt & Martin, 2000). Third, resource innovation processes demonstrate how organisations transcend traditional resource constraints through creative recombination, strategic partnerships, and capability development that creates competitive advantages from limitation rather than abundance (Penrose, 1959; Baker & Nelson, 2005).

The integration of these theoretical domains addresses a significant gap in existing literature, where sense-making, strategic adaptation, and resource innovation have been predominantly examined as separate phenomena despite their evident interconnection during uncertainty navigation. Traditional strategic management literature treats these as distinct organisational capabilities requiring different theoretical frameworks and analytical approaches (Barney, 1991; Porter, 1996). However, emerging evidence from crisis management research suggests that effective uncertainty navigation requires dynamic integration of cognitive, strategic, and resource-based capabilities that operate simultaneously rather than sequentially, creating synergistic effects that exceed individual capability contributions (Teece, 2018; Sirmon et al., 2011).

The evidence suggests that organisations capable of integrating sense-making sophistication with strategic adaptation flexibility and resource innovation capability may possess fundamental advantages for navigating uncertainty that transcend simple risk management or resilience maintenance. Understanding these integrated capabilities appears crucial for developing theoretical frameworks that can account for the notable transformation achievements observed in crisis management whilst providing practical guidance for organisations seeking to enhance their uncertainty navigation effectiveness.

Sense-Making Theory: Constructing Meaning from Uncertainty

Foundations of Organisational Sense-Making

Sense-making theory emerged from social psychology and organisational behaviour research as a framework for understanding how individuals and organisations construct meaning from ambiguous, complex, or contradictory environmental information, providing cognitive foundations for coherent action despite incomplete knowledge and uncertain outcomes (Weick, 1995; Thomas et al., 1993). The theoretical development originated from recognition that organisational environments are not objective realities to be discovered but constructed interpretations that emerge through active cognitive engagement with environmental signals, stakeholder interactions, and historical experience (Berger & Luckmann, 1966; Daft & Weick, 1984). This constructivist orientation distinguishes sense-making approaches from

traditional strategic analysis that assumes environmental conditions can be objectively assessed and predicted through systematic information gathering and analytical processing.

Karl Weick's (1995) seminal contribution established sense-making as a fundamental organisational process characterised by seven distinctive properties that differentiate it from other cognitive activities including decision-making, interpretation, and learning. These properties are *identity construction, retrospection, enactment, social activity, ongoing process, extracted cues*, and *plausibility over accuracy* provide analytical frameworks for understanding how organisations develop coherent understanding of complex environmental conditions whilst maintaining capacity for adaptive response to changing circumstances. The sophistication of Weick's framework lies not in identifying individual cognitive processes but in revealing how these processes interact dynamically to create organisational capabilities for uncertainty navigation that exceed individual cognitive capacity.

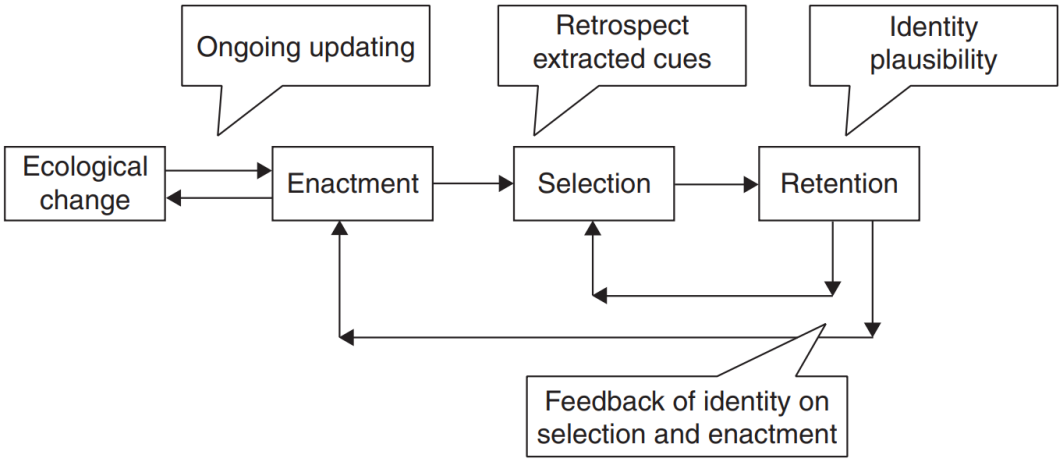


Figure 3.0 - The Relationship Among Enactment, Organising, and Sensemaking. Reproduced from Jennings and Greenwood 2003; adapted from Weick 1979, p. 132.

Identity construction represents the foundational property of organisational sense-making, establishing that understanding environmental conditions requires prior clarity about organisational identity, purpose, and capability boundaries that provide interpretive

frameworks for environmental assessment (Weick, 1995; Gioia et al., 2013). Without coherent organisational identity, environmental signals cannot be evaluated for relevance, significance, or strategic implications, creating cognitive paralysis that prevents effective response to changing conditions.

However, identity construction during crisis periods becomes particularly complex, as environmental disruption may challenge established identity assumptions whilst demanding rapid adaptation that requires identity flexibility rather than rigid self-conception. The identity construction property assumes organisational identity coherence that may not characterise dynamic or crisis conditions, where identity itself becomes contested and fragmented (Gioia et al., 2013). The framework underestimates the resource and capability constraints that define SME crisis contexts. The seven properties assume cognitive resources, stable relationships, and analytical capabilities that resource-constrained enterprises lack during existential crises.

Retrospective sense-making acknowledges that organisational understanding emerges through reflection on past actions and experiences rather than prospective analysis of future possibilities, challenging traditional strategic planning assumptions about the primacy of forward-looking analysis (Weick, 1995; Crossan et al., 2011). This retrospective orientation does not imply backward-looking decision-making but rather recognition that learning and understanding develop through systematic reflection on action consequences, stakeholder responses, and environmental changes that provide information unavailable through analytical prediction. The implications for uncertainty navigation are profound, suggesting that effective strategic development may require experimental action followed by reflective learning rather than comprehensive planning followed by implementation.

However, the retrospective property, whilst acknowledging learning from experience, potentially underestimates the importance of prospective sense-making during uncertainty periods when historical precedents become inadequate guides for future action (Holt & Cornelissen, 2014). This limitation appears particularly problematic for understanding how organisations navigate unprecedented conditions such as the COVID-19 pandemic.

Enactment represents perhaps the most radical property of sense-making theory, proposing that organisations actively create environmental conditions through their interpretations and actions rather than simply responding to predetermined external realities (Weick, 1995; Smircich & Stubbart, 1985). This perspective suggests that strategic effectiveness may depend more on capability to shape environmental conditions through coherent action than on accuracy in predicting environmental change or optimality in resource allocation. The enactment property has particular relevance for understanding how organisations navigate uncertainty, as it implies that uncertainty itself may be partially constructed through organisational interpretation rather than representing purely external constraint. Whilst the insight that organisations partially create their environments through interpretation and action provides valuable understanding of environmental construction, it potentially overstates organisational agency whilst understating structural constraints that limit interpretive flexibility (Cornelissen et al., 2020).

Property	**Definition**	**Organisational Implications**	**SME Context Considerations**
Identity Construction	Sense-making requires prior clarity about organisational identity and purpose	Provides interpretive frameworks for environmental assessment	SME identity may be more flexible but less established
Retrospection	Understanding emerges through reflection on past actions rather than prospective analysis	Learning develops through systematic reflection on action consequences	Limited organisational memory may constrain retrospective learning
Enactment	Organisations actively create environmental conditions through interpretations and actions	Strategic effectiveness depends on capability to shape environment	SMEs may have limited environmental shaping power

Social Activity	Sense-making occurs through interaction and collective interpretation	Requires collaborative processes and shared meaning construction	Smaller teams may enable faster consensus but limit diverse perspectives
Ongoing Process	Sense-making is continuous rather than discrete activity	Requires sustained attention and organisational capability	Resource constraints may limit continuous sense-making investment
Extracted Cues	Interpretation focuses on simple, familiar structures from complex environments	Enables action despite incomplete information	May oversimplify complex environmental conditions
Plausibility over Accuracy	Coherent action matters more than precise environmental understanding	Enables decision-making under uncertainty	May create confidence for action but risk misinterpretation

Table 3.0 - Weick's Seven Properties of Organisational Sense-Making and SME Applications, Author 2024

Sense-making as ***social activity*** emphasises that interpretation occurs through interaction and collective engagement rather than individual cognitive processing, recognising that organisational understanding emerges through conversation, collaboration, and shared meaning construction that exceeds individual analytical capability (Weick, 1995, pp. 38-43). This property challenges individualistic assumptions about organisational cognition by revealing how collective sense-making can enhance interpretive sophistication whilst creating shared understanding that enables coordinated action.

Social sense-making involves systematic integration of diverse perspectives, experiences, and expertise to create organisational understanding that incorporates multiple viewpoints whilst maintaining coherence and actionability (Balogun & Johnson, 2004). Effective social sense-making requires organisational design that facilitates information sharing, encourages diverse

perspective contribution, and enables integration processes that create collective understanding without losing individual insight contributions.

The social property becomes particularly important during crisis periods when environmental complexity exceeds individual cognitive capacity whilst requiring collective response that demands shared understanding and coordinated action (Maitlis & Sonenshein, 2010). Crisis conditions may accelerate social sense-making through urgency that overcomes normal communication barriers whilst creating collaborative requirements that individual sense-making cannot address adequately.

For SMEs, social sense-making exhibits distinctive patterns because smaller organisational size enables more intimate interaction whilst resource constraints may limit diverse perspective access (Fassin, 2008). SME social sense-making may be more rapid and integrated because communication pathways are shorter and decision-making authority is concentrated. However, SME social sense-making may also be more limited because fewer organisational members contribute diverse perspectives whilst external stakeholder engagement may be constrained by resource limitations. During crisis periods, SME social sense-making may benefit from stakeholder proximity and relationship authenticity that enables rapid collective understanding development whilst suffering from limited expertise diversity and analytical resource constraints that could enhance interpretive sophistication.

The ***ongoing process*** property recognises sense-making as continuous organisational activity rather than discrete cognitive events, emphasising that interpretation flows continuously through organisational life whilst creating accumulated understanding that evolves through sustained engagement with environmental signals and action consequences (Weick, 1995, pp. 43-49). This property challenges event-based thinking about organisational cognition by revealing how interpretive capabilities develop through sustained practice whilst creating organisational memory and wisdom that enhances future sense-making effectiveness.

Ongoing sense-making involves systematic attention to environmental signals, stakeholder feedback, and action outcomes that provides continuous learning whilst enabling interpretive framework refinement and strategic adaptation (Crossan et al., 2011). Organisations develop

sense-making sophistication through accumulated experience whilst creating interpretive capabilities that enhance environmental navigation and strategic development over time.

The process orientation has particular relevance for understanding how organisations develop crisis management capabilities through sustained experience with uncertainty navigation rather than discrete crisis management training or planning activities (Rerup, 2009). Crisis management effectiveness may emerge through accumulated sense-making experience that creates interpretive confidence and cognitive resources for addressing novel challenges rather than representing fixed organisational characteristics.

Extracted cues involve the cognitive process through which sense-makers identify simple, familiar structures from complex environmental information, enabling action despite incomplete understanding whilst maintaining cognitive efficiency that comprehensive analysis would prevent (Weick, 1995, pp. 49-55). This property recognises that effective sense-making requires cognitive shortcuts that enable rapid interpretation and action whilst acknowledging the risks of oversimplification and selective attention that cue extraction may create. Cue extraction involves identifying environmental signals that provide interpretive anchors whilst ignoring information that exceeds cognitive processing capacity or appears irrelevant to immediate interpretive requirements.

Effective cue extraction requires developing pattern recognition capabilities that enable rapid identification of significant environmental changes whilst maintaining sensitivity to weak signals that may indicate emerging opportunities or threats. The cue extraction process becomes particularly crucial during crisis periods when information overload may overwhelm normal cognitive processing whilst requiring rapid interpretation and response that comprehensive analysis cannot achieve within available time constraints (Weick, 1988). Crisis cue extraction may involve identifying key indicators that provide interpretive guidance whilst filtering environmental noise that could create confusion or paralysis.

However, cue extraction also creates significant risks including cognitive bias, selective attention, and oversimplification that may constrain interpretive accuracy whilst preventing recognition of important environmental information that does not fit established cue recognition patterns (Kahneman, 2011). Organisations may develop cue extraction habits that

worked in previous environmental conditions but prove inadequate for novel challenges requiring different interpretive approaches, how it was for instance in a novel crisis such as COVID-19 disaster.

For SMEs, cue extraction may be both more necessary due to limited analytical resources and more risky due to reduced capability for comprehensive environmental analysis that could identify extraction errors or missing information (Smallbone et al., 2012). Additionally, SME cue extraction may rely heavily on owner-manager experience and intuition that provides rapid interpretation whilst potentially missing environmental signals that require more systematic analysis or diverse perspective integration.

Lastly, the *plausibility over accuracy* property arguably represents Weick's most controversial and practically important insight, arguing that sense-making effectiveness depends more on coherent action capability than precise environmental understanding, suggesting that "good stories" may be more valuable than "true stories" when interpretation must enable rapid response under uncertainty conditions (Weick, 1995, pp. 55-62). This property recognises that perfect environmental understanding is neither achievable nor necessary for effective organisational action, whilst comprehensive analysis attempts may create cognitive paralysis that prevents necessary response when environmental conditions demand immediate action (Simon, 1976). Plausible interpretation enables confidence and coordination whilst maintaining adaptive capacity for interpretive modification based on action feedback and environmental response.

The plausibility property has particular relevance for crisis management where rapid response requirements often conflict with analytical thoroughness whilst creating stakeholder impact concerns that interpretive frameworks must address despite incomplete information and uncertain outcomes (Bundy et al., 2017). Plausible crisis interpretation may enable stakeholder confidence and organisational coherence whilst providing decision justification that purely analytical approaches cannot achieve when analysis remains incomplete due to uncertainty and time constraints.

However, the plausibility over accuracy orientation faces significant criticism for potentially encouraging interpretive laziness whilst undermining confidence in sense-making conclusions

that may be essential for strategic commitment and stakeholder engagement (Sandberg & Tsoukas, 2015). The plausibility criterion may be insufficient for strategic decision-making that requires resource commitments and stakeholder relationship development based on interpretive conclusions about environmental conditions and strategic opportunities. Additionally, the plausibility criterion may systematically bias interpretation toward familiar patterns and comfortable conclusions whilst preventing recognition of environmental changes that require uncomfortable interpretive framework reconstruction or strategic adaptation (Weick & Sutcliffe, 2007).

Looking at the Weick's framework overall, it is not about identifying individual cognitive processes but in revealing how these seven properties interact dynamically to create organisational capabilities for uncertainty navigation that exceed individual cognitive capacity whilst maintaining practical applicability for organisational design and development (Maitlis & Christianson, 2014). The properties operate simultaneously rather than sequentially, creating interpretive capabilities that enable coherent action despite environmental ambiguity and information limitations.

The identity construction property provides interpretive frameworks that guide cue extraction whilst enabling social activity that creates collective understanding through ongoing processes that build interpretive sophistication over time. Retrospective learning informs prospective action whilst enactment creates environmental conditions that provide feedback for identity refinement and framework development. Plausibility enables action whilst accuracy aspirations guide learning and development that enhances future sense-making capability.

The COVID-19 pandemic provided opportunities for observing Weick's properties in action whilst revealing both their practical value and theoretical limitations when applied to extreme uncertainty conditions that exceed normal organisational experience (Alves et al., 2022). Understanding how these properties operate during crisis conditions whilst identifying their boundary conditions and enhancement possibilities represents crucial challenge for advancing both theoretical understanding and practical effectiveness of organisational sense-making under contemporary uncertainty conditions.

Weick's seven properties collectively reveal sense-making as a sophisticated organisational capability that enables effective action under uncertainty whilst maintaining learning capacity and adaptive potential that enhances future uncertainty navigation effectiveness. The framework challenges traditional assumptions about optimal decision-making whilst providing practical insights into how organisations can enhance interpretive capabilities through systematic attention to identity development, social interaction, ongoing learning, and plausible interpretation that enables coherent action despite environmental ambiguity.

However, the framework also faces significant limitations including cultural specificity, analytical vagueness, and methodological challenges that constrain theoretical development whilst limiting practical application guidance (Cornelissen et al., 2020). Additionally, the relationship between sense-making and decision-making represents some fundamental tensions. Weick's emphasis on "plausibility over accuracy" potentially creates decision-making paralysis by undermining confidence in interpretive conclusions whilst providing inadequate guidance for action under uncertainty (Sandberg & Tsoukas, 2015). The plausibility criterion may be insufficient for strategic decision-making that requires sufficient confidence to commit resources and stakeholder relationships based on interpretive conclusions.

The predominance of interpretive methodologies in sense-making research creates significant analytical limitations that constrain theoretical development and empirical validation (Cornelissen et al., 2020). The reliance on retrospective interviews and case studies may systematically bias findings toward post-hoc rationalisation whilst missing the confusion, contradiction, and provisional nature of actual sense-making processes. The temporal dimension of sense-making research presents particular methodological challenges, as real-time observation of interpretive processes requires access and methods that may alter the sense-making processes under investigation (Langley et al., 2013). Therefore, sense-making research requires methodological innovations that can capture interpretive dynamics without fundamentally altering them.

Key Recent Developments in Sense-Making Research

Modern organisational sense-making research has expanded beyond Weick's foundational framework to examine how sense-making capabilities develop, operate across organisational levels, and interact with other organisational processes including strategic planning, organisational learning, and stakeholder management (Maitlis & Christianson, 2014; Sandberg & Tsoukas, 2015). This research evolution reflects increasing recognition that sense-making represents a critical organisational capability rather than simply individual cognitive activity, requiring systematic development and strategic deployment to enhance organisational effectiveness under uncertain conditions.

Maitlis and Christianson's (2014) comprehensive review identifies four distinct sense-making approaches that organisations employ during uncertainty navigation: guided sense-making involving deliberate leadership direction of interpretation processes; fragmented sense-making characterised by multiple competing interpretations without organisational integration; restricted sense-making limited by cognitive or resource constraints; and minimal sense-making representing absence of systematic interpretation processes. This typological framework addresses a crucial gap in Weick's foundational theory by providing analytical categories that explain variation in organisational sense-making effectiveness whilst offering practical guidance for enhancing interpretive capabilities under different organisational conditions and environmental challenges.

The framework emerged from systematic analysis of sense-making research across multiple organisational contexts, revealing that sense-making effectiveness depends not only on cognitive capabilities but also on organisational design, leadership approaches, resource availability, and environmental characteristics that shape interpretive processes and outcomes (Maitlis & Christianson, 2014, pp. 67-83). This contextual understanding challenges assumptions about universal sense-making principles whilst highlighting the importance of situational factors that determine optimal approaches to uncertainty navigation and interpretive capability development.

The *guided sense-making approach* involves deliberate leadership intervention to establish interpretive frameworks, facilitate collective interpretation processes, and integrate diverse

perspectives into coherent organisational understanding (Maitlis & Lawrence, 2007). This approach appears particularly relevant during crisis periods when environmental ambiguity creates multiple possible interpretations that require leadership synthesis to enable coordinated organisational response. However, guided sense-making also risks creating interpretation bias through excessive leadership influence that may prevent recognition of disconfirming evidence or alternative understanding that could enhance adaptive response.

Fragmented sense-making emerges when organisational subunits develop competing interpretations of environmental conditions without effective integration mechanisms, creating internal confusion and coordination challenges that may impair organisational response effectiveness (Maitlis, 2005). This fragmentation appears particularly problematic for SMEs with limited coordination resources, yet it may also provide interpretive diversity that enhances environmental scanning and adaptive response capability when managed effectively through systematic integration processes. SME fragmented sense-making exhibits distinctive patterns because smaller organisational size may limit fragmentation scope whilst resource constraints may prevent systematic integration mechanisms that larger organisations could develop (Davidsson et al., 2020). SME fragmentation may occur across functional areas, hierarchical levels, or stakeholder groups rather than formal departmental boundaries that characterise larger organisations.

Restricted sense-making emerges when cognitive or resource constraints limit interpretive capability whilst forcing simplified interpretations that may provide rapid decision-making capability but risk oversimplification and missed environmental intelligence that could enhance organisational effectiveness (Maitlis & Christianson, 2014, pp. 74-77). This approach represents common organisational reality where ideal sense-making processes exceed available resources whilst demanding practical approaches that enable action despite interpretive limitations. For SMEs, restricted sense-making may represent optimal approach given structural characteristics and resource realities that make comprehensive analytical approaches impractical whilst potentially providing decision-making advantages through simplicity and speed (Davidsson et al., 2020). SME resource constraints may force beneficial simplification that prevents analysis paralysis whilst enabling rapid adaptation and experimental learning that comprehensive planning approaches might prevent.

Lastly, *minimal sense-making* represents the absence of systematic interpretation processes, characterised by reactive responses, limited environmental scanning, and cognitive frameworks that provide inadequate guidance for uncertainty navigation whilst creating organisational vulnerabilities that may impair crisis survival and strategic development (Maitlis & Christianson, 2014, pp. 77-80). This approach often emerges during extreme resource constraints, organisational crisis, or leadership failure whilst creating interpretive inadequacy that may accelerate organisational decline through poor environmental assessment and strategic response.

Recovering from minimal sense-making requires systematic capability development that may exceed organisational resources whilst demanding leadership commitment and cultural change that could prove difficult to achieve within existing organisational conditions (Maitlis & Christianson, 2014). Leadership development may be essential for creating interpretive capability whilst requiring individual skill development and organisational design changes that enable systematic environmental analysis and strategic thinking.

Approach	**Characteristics**	**Leadership Role**	**Organisational Outcomes**	**SME Applicability**
Guided Sense-Making	Deliberate leadership direction; Structured interpretation processes; Integrated organisational understanding	High involvement in establishing frameworks and facilitating integration	Coordinated response; Reduced confusion; Risk of leadership bias	High - suits owner-manager control
Fragmented Sense-Making	Multiple competing interpretations; Limited organisational	Minimal coordination between different	Interpretive diversity; Coordination challenges;	Medium - may suit functional diversity

	integration; Subunit-based understanding	interpretive groups	Potential for innovation	
Restricted Sense-Making	Limited by cognitive constraints; Resource limitations; Simplified interpretations	Constrained by resource or capability limitations	Rapid decision-making; Risk of oversimplification; Missed opportunities	High - reflects SME resource constraints
Minimal Sense-Making	Absence of systematic interpretation; Reactive responses; Limited environmental scanning	Little to no leadership in interpretation processes	Crisis vulnerability; Missed environmental signals; Reactive positioning	Low - risky for uncertainty navigation

Table 3.1 - Typology of Organisational Sense-Making Approaches. Adapted from Maitlis and Christianson, 2014

For SMEs, Maitlis and Christianson's framework provides particularly valuable insights because SME characteristics create distinctive patterns of sense-making capability and constraint that require tailored approaches rather than scaled versions of large organisation frameworks (Davidsson et al., 2020). SME sense-making approaches must accommodate resource constraints whilst leveraging unique advantages including decision-making speed, stakeholder proximity, and organisational flexibility.

Furthermore, recent sense-making research has particularly emphasised the social and collective dimensions of organisational interpretation, challenging individualistic assumptions in early sense-making literature whilst revealing how collective sense-making can enhance organisational capability for uncertainty navigation (Balogun & Johnson, 2004; Cornelissen et al., 2020). Collective sense-making involves systematic integration of diverse perspectives,

experiences, and expertise to create shared understanding that exceeds individual cognitive capacity whilst maintaining sensitivity to environmental complexity and interpretive uncertainty.

Sense-Making During Crisis and Extreme Uncertainty

Crisis conditions create distinctive sense-making challenges that exceed normal organisational interpretation requirements, involving breakdown of established cognitive frameworks, information overload from multiple simultaneous signals, time pressure limiting reflection and integration processes, and emotional stress affecting cognitive processing capacity (Weick, 1988; Rerup, 2009). These conditions can overwhelm normal sense-making processes whilst simultaneously creating urgent requirements for coherent interpretation that enables effective crisis response. Understanding how organisations maintain sense-making effectiveness during crisis periods appears crucial for explaining differential crisis outcomes and identifying mechanisms that enable transformation rather than mere survival.

The breakdown of established cognitive frameworks represents perhaps the most fundamental crisis sense-making challenge, requiring organisations to reconstruct interpretive capabilities whilst managing immediate operational pressures (Christianson et al., 2009). Traditional organisational routines, strategic assumptions, and environmental understanding may become obsolete rapidly during crisis conditions, forcing what Weick (1995) characterises as "cosmology episodes" where fundamental assumptions about organisational reality require reconstruction. According to him, “a cosmology episode occurs when people suddenly and deeply feel that the universe is no longer a rational, orderly system...what makes such an episode, so shattering is that both the sense of what is occurring and the means to rebuild that sense collapse together”. Thus, both the ability to understand the situation and the ability to use reason to create a new order are lost during a cosmology episode. In other words, these episodes create both vulnerability through temporary loss of interpretive capability and opportunity through forced reconsideration of limiting assumptions that may have constrained strategic development.

Information overload during crisis periods can paradoxically reduce sense-making effectiveness despite increased environmental scanning and stakeholder communication

(Balogun & Johnson, 2004). The volume and complexity of crisis-related information may exceed organisational processing capacity, whilst conflicting signals from different stakeholder groups create interpretive challenges that require sophisticated filtering and integration capabilities. Effective crisis sense-making may therefore depend more on selective attention and interpretive discipline than on comprehensive information gathering, challenging assumptions about optimal organisational scanning processes.

Time pressure affects sense-making by limiting opportunities for reflection, consultation, and integration that normally contribute to interpretive quality and organisational learning (Rerup, 2009; Maitlis & Sonenshein, 2010). Crisis conditions often demand rapid response based on incomplete understanding, creating tension between speed and accuracy that may force organisations to prioritise plausible interpretation over comprehensive analysis. This tension highlights the importance of Weick's (1995) emphasis on plausibility over accuracy as a fundamental sense-making property, suggesting that crisis effectiveness may depend more on coherent action than on precise environmental understanding.

However, crisis conditions may also enhance sense-making capability through focused attention, increased stakeholder communication, and experiential learning that provides rich information about environmental conditions and organisational capability (Rerup, 2009; Cornelissen et al., 2020). The intensity of crisis experience can accelerate learning cycles whilst revealing organisational strengths and weaknesses that may not be apparent under normal operating conditions. Crisis-enhanced sense-making may therefore create opportunities for fundamental organisational development that would be difficult to achieve through normal strategic planning processes.

Recent empirical research examining organisational sense-making during the COVID-19 pandemic has provided unprecedented insights into how enterprises construct meaning from extreme uncertainty whilst revealing both the potential and limitations of existing sense-making frameworks (Alves et al., 2022; Kuckertz et al., 2022). Empirical studies of SME sense-making during COVID-19 reveal patterns that both support and challenge Weick's theoretical framework. Davidsson et al. (2022) document how Swedish SMEs developed "crisis sense-making capabilities" that enabled rapid interpretive framework reconstruction, supporting arguments about sense-making as learnable organisational capability. However, their findings

also reveal interpretive exhaustion during extended crisis periods when continuous framework reconstruction exceeded organisational cognitive capacity, suggesting boundary conditions for sense-making effectiveness that Weick's framework inadequately addresses.

Kraus et al. (2022) provide quantitative evidence that SMEs with superior sense-making capabilities achieved better crisis outcomes, yet their findings reveal significant variation in sense-making effectiveness that existing theory cannot adequately explain. Their research suggests that sense-making capability may be more contingent on organisational characteristics and environmental contexts than Weick's universal framework implies, requiring theoretical development that accounts for sense-making capability variation and development conditions.

Temporal Dynamics and Process Perspectives in Sense-Making

The temporal dimension of sense-making has received increasing attention as researchers recognise that interpretive capabilities develop and evolve through sustained experience whilst creating learning accumulation that enhances future sense-making effectiveness (Sandberg & Tsoukas, 2015; Holt & Cornelissen, 2014). This temporal perspective challenges static conceptions of sense-making as discrete cognitive activity, instead treating it as a dynamic capability that develops sophistication through practice and experience whilst creating organisational memory that provides interpretive resources for future uncertainty navigation.

Process theory provides analytical frameworks for understanding how sense-making capabilities evolve through what Langley et al. (2013) characterise as “temporal bracketing” - the identification of distinct phases during which different sense-making characteristics predominate whilst building upon previous interpretive development. This process perspective reveals that sense-making sophistication emerges through accumulated exposure to uncertainty rather than representing fixed cognitive capacity, suggesting that organisations can develop enhanced interpretive capabilities through systematic experience and reflection.

Temporal learning accumulation through sense-making creates interpretive capital that enhances organisational capability for future uncertainty navigation (Crossan et al., 2011; Bapuji & Crossan, 2020). This capital includes refined environmental scanning capabilities, enhanced pattern recognition skills, improved stakeholder relationship understanding, and accumulated experience with uncertainty navigation that provides confidence and cognitive resources for addressing novel challenges. The development of interpretive capital suggests that sustained uncertainty exposure may enhance rather than diminish organisational capability when supported by effective sense-making processes.

The interaction between individual and organisational sense-making creates additional temporal complexity, as individual learning must be integrated into organisational memory and capability development to create lasting interpretive enhancement (Crossan et al., 2011). This integration requires systematic processes for capturing individual insights, facilitating knowledge sharing, and embedding learning into organisational routines and decision-making frameworks. The effectiveness of these integration processes may significantly affect organisational capability for uncertainty navigation whilst determining whether crisis experience creates lasting enhancement or temporary adaptation.

Resource-Based Theory and Resource Innovation Under Constraint

Evolution of Resource-Based Strategic Theory

Resource-based theory emerged as a dominant paradigm in strategic management through recognition that sustainable competitive advantage derives primarily from valuable, rare, inimitable, and non-substitutable (VRIN) resources and capabilities rather than product-market positioning or industry structure advantages (Barney, 1991; Wernerfelt, 1984). The theory's foundational insight involves shifting analytical focus from external competitive positioning to internal resource development and deployment, arguing that organisations possessing superior resources can achieve sustained competitive advantage regardless of industry characteristics or market conditions. This perspective has profoundly influenced strategic management research and practice by emphasising resource development, capability building, and competence-based competition as primary strategic concerns.

Penrose's (1959) seminal work provided theoretical foundations for resource-based thinking through her analysis of firm growth and resource utilisation, proposing that organisations represent collections of productive resources capable of generating multiple services depending on their application and combination. Her insight that "the same resources used for different purposes or in different ways and in combination with different types or amounts of other resources provide different services" (p. 25) established the conceptual foundation for understanding resource heterogeneity and competitive advantage creation through resource application rather than simple resource accumulation. This perspective implies that strategic effectiveness may depend more on cognitive capability to identify novel resource applications than on financial capability to acquire superior resources.

The development of dynamic capabilities theory extended resource-based logic to encompass organisational capabilities for resource development, integration, and reconfiguration that enable sustained competitive advantage under changing environmental conditions (Teece et al., 1997; Eisenhardt & Martin, 2000). Dynamic capabilities involve systematic processes for resource sensing, seizing, and transformation that enable organisations to modify resource configurations in response to environmental change whilst maintaining competitive effectiveness. This extension addressed criticisms that static resource-based theory could not account for competitive advantage under dynamic conditions by emphasising organisational capabilities for resource adaptation and development.

Recent resource-based research has increasingly emphasised resource orchestration processes that enable organisations to structure, bundle, and leverage resources for competitive advantage creation (Sirmon et al., 2007, 2011). Resource orchestration involves three sequential processes: structuring involves acquiring, accumulating, and divesting resources to create optimal resource portfolios; bundling involves integrating resources into capabilities that enable value creation; and leveraging involves deploying capabilities for competitive advantage realisation and strategic objective achievement. This orchestration perspective emphasises managerial capability for resource coordination and deployment rather than simple resource possession as determinants of competitive advantage.

Sirmon et al.'s (2007, 2011) resource orchestration framework attempts to address resource-based theory limitations by emphasising managerial capabilities for resource structuring,

bundling, and leveraging. However, the orchestration framework may represent fundamental theoretical revision rather than simple extension, as it shifts analytical focus from resource characteristics to managerial capabilities whilst introducing process dynamics that were absent from original resource-based formulations.

Resource-based theory emerged as a dominant paradigm in strategic management through Barney's (1991) systematic articulation of the VRIN framework, yet the theory's evolution reveals fundamental contradictions and unresolved tensions that limit its explanatory power for understanding uncertainty navigation, particularly in resource-constrained SME contexts (Kraaijenbrink et al., 2010; Newbert, 2007). The theory's emphasis on resource accumulation and competitive advantage maintenance conflicts with emerging evidence about constraint-driven innovation and collaborative value creation that characterise contemporary uncertainty navigation. However, traditional resource-based theory faces several limitations when applied to uncertainty navigation contexts. The theory's emphasis on resource abundance and accumulation may disadvantage resource-constrained organisations whilst overlooking competitive advantages that emerge through creative resource utilisation rather than resource accumulation (Kraaijenbrink et al., 2010; George, 2005).

Empirical testing of resource-based theory has produced inconsistent results that raise questions about the theory's predictive validity and practical applicability (Newbert, 2007; Armstrong & Shimizu, 2007). The VRIN criteria exhibit particular limitations for understanding SME uncertainty navigation. The “valuable” criterion assumes market-based value assessment that may not capture value creation potential in emerging or disrupted markets where traditional value metrics become obsolete. The “rare” criterion emphasises scarcity over creativity, potentially missing competitive advantages that emerge through novel applications of common resources. The “inimitable” criterion focuses on protection over innovation, whilst the “non-substitutable” criterion emphasises uniqueness over adaptability as characteristics that may be less important than flexibility and creativity during uncertainty periods.

Resource Constraint and Creative Utilisation

The relationship between resource constraint and organisational performance has generated significant research interest, revealing complex patterns that challenge simple assumptions about resource abundance as prerequisite for strategic effectiveness (George, 2005; Mosakowski, 2002). Resource constraint can stimulate creative problem-solving, force efficiency improvements, and encourage innovative resource utilisation that may create competitive advantages unavailable under resource abundance conditions. Understanding these mechanisms appears particularly important for SME strategic management, where resource constraints represent permanent operating conditions rather than temporary challenges requiring defensive response.

Resource constraint effects on creativity and innovation have been documented across multiple organisational contexts, revealing how limitation can stimulate cognitive flexibility and experimental behaviour that enhances problem-solving capability (Gibbert et al., 2007; Hoegl et al., 2008). Constraint forces systematic evaluation of available resources whilst encouraging consideration of novel applications and combinations that may not emerge under resource abundance. This creative pressure can accelerate learning cycles whilst revealing hidden resource potential that provides foundation for strategic development.

Frugal innovation represents a systematic approach to value creation under resource constraint that emphasises functionality, cost reduction, and accessibility enhancement rather than feature maximisation or premium positioning (Radjou & Prabhu, 2015; Bhatti & Ventresca, 2013). Frugal approaches often achieve superior customer value through focused functionality delivery whilst maintaining cost structures that enable broad market access. This perspective suggests that resource constraint may force customer-centric innovation that creates competitive advantages through value delivery rather than resource superiority.

Bricolage theory provides theoretical frameworks for understanding how organisations create value through creative recombination of available resources rather than optimal resource acquisition (Baker & Nelson, 2005; Senyard et al., 2014). Bricolage involves "making do" with available resources through creative application, combination, and adaptation that enables value creation despite resource limitations. This perspective emphasises cognitive

capability for resource application rather than financial capability for resource acquisition as determinants of strategic effectiveness. Both theories on frugality and bricolage will be discussed further in this section.

However, resource constraint can also create performance limitations through inadequate capabilities, insufficient capacity, and inability to pursue strategic opportunities requiring resource investment (Bradley et al., 2011). The relationship between constraint and performance appears contingent on organisational capabilities for constraint management, creative resource utilisation, and strategic focus that enables effective resource deployment within limitation parameters. Understanding these contingent relationships may be crucial for developing strategic approaches that leverage constraint advantages whilst managing constraint disadvantages.

The COVID-19 pandemic has provided extensive empirical evidence about constraint-driven innovation that both supports and challenges traditional resource-based theory assumptions whilst revealing new patterns of competitive advantage creation under extreme resource limitation (Kraus et al., 2021; Ratten, 2023). Systematic studies of SME innovation during the pandemic document widespread creative resource utilisation that created competitive advantages through constraint navigation rather than resource accumulation, providing what Giones et al. (2022) characterise as "natural experimental evidence" for constraint-advantage relationships.

Quantitative analysis of 1,247 European SMEs during COVID-19 reveals that resource-constrained enterprises achieved superior innovation outcomes compared to resource-abundant competitors through what Kraus et al. (2021) term "necessity-driven innovation" that leveraged constraint pressure for creative problem-solving. These findings directly contradict resource-based theory predictions whilst supporting emerging theories about constraint as innovation catalyst rather than limitation.

However, longitudinal studies also reveal "constraint fatigue" effects where extended resource limitation eventually diminished innovation capability whilst creating survival threats that overwhelmed creative capacity (Ratten, 2023). These findings suggest that constraint-advantage relationships may be temporally bounded whilst requiring

organisational capabilities for constraint management that existing theory inadequately specifies.

Bricolage Theory and Creative Resource Utilisation

Bricolage theory provides crucial frameworks for understanding how organisations create value through creative recombination of available resources rather than optimal resource acquisition, offering particular insights into how resource-constrained organisations can achieve strategic effectiveness through innovative resource application (Baker & Nelson, 2005; Senyard et al., 2014). The concept, derived from Levi-Strauss's anthropological work, describes "making do" with resources at hand through creative application, combination, and adaptation that enables value creation despite resource limitations. This perspective challenges traditional resource-based assumptions about resource accumulation as prerequisite for competitive advantage, instead emphasising cognitive capability for resource creativity as determinant of strategic effectiveness.

Baker and Nelson's (2005) seminal contribution identify three forms of bricolage that organisations employ under resource constraint: *input* bricolage involving creative use of physical materials and resources; *labour* bricolage applying skills and knowledge to novel problems; and *institutional* bricolage navigating regulatory and stakeholder environments through creative compliance and relationship development. Each form requires different cognitive capabilities whilst contributing to overall organisational capacity for constraint navigation and value creation through resource creativity rather than resource abundance.

Selective bricolage represents the most sophisticated form, involving systematic combination of creative resource utilisation with strategic resource acquisition that enables competitive advantage creation whilst maintaining resource discipline (Baker & Nelson, 2005). Selective bricolage requires analytical capability to distinguish between situations requiring creative adaptation versus situations demanding resource investment, enabling optimal resource allocation across different strategic priorities. This discriminating capability appears particularly important for SMEs operating under permanent resource constraint where bricolage and resource acquisition must be balanced strategically.

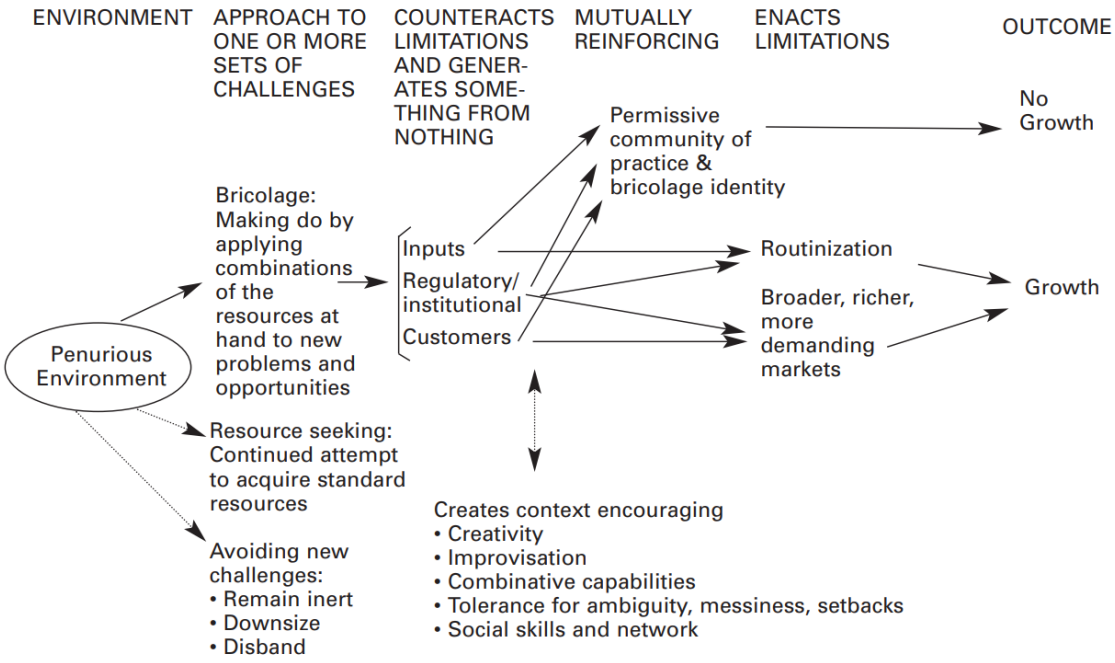


Figure 3.1 - A process model of bricolage and growth. Reproduced from Baker and Nelson, 2005

Recent bricolage research has extended the theoretical framework to encompass digital bricolage, international bricolage, and strategic bricolage that apply bricolage principles to broader organisational contexts whilst revealing how bricolage capabilities can create sustainable competitive advantages rather than simply enabling survival under constraint (Senyard et al., 2014; Desa & Basu, 2013). Digital bricolage involves creative utilisation of digital technologies and platforms for value creation, whilst international bricolage applies creative resource combination across cultural and institutional boundaries. Strategic bricolage integrates creative resource utilisation with systematic strategic development to create lasting competitive advantages.

The relationship between bricolage and effectuation reveals important theoretical connections, as both frameworks emphasise leveraging available means whilst managing uncertainty through experimental action rather than comprehensive planning (Sarasvathy, 2001; Baker & Nelson, 2005). However, bricolage focuses specifically on resource creativity under constraint whilst effectuation addresses broader uncertainty navigation principles. The integration of bricolage and effectuation may provide enhanced frameworks for understanding how resource-constrained organisations navigate uncertainty through means-driven action and creative resource utilisation.

Bricolage Type	Definition	Mechanisms	SME Applications	Crisis Context Benefits
Input Bricolage	Creative use of physical materials and resources for novel purposes	Resource recombination; Alternative applications; Functional substitution	Equipment multi-purposing; Facility adaptation; Supply chain flexibility	Resource scarcity management; Operational continuity; Cost reduction
Labour Bricolage	Applying skills and knowledge to problems outside their intended domain	Skill transfer; Role flexibility; Cross-functional application	Multi-skilled workforce; Flexible job descriptions; Learning organisation	Workforce adaptability; Capability expansion; Reduced hiring needs
Institutional Bricolage	Creative navigation of regulatory and stakeholder environments	Compliance creativity; Relationship leveraging; Governance innovation	Regulatory flexibility; Stakeholder engagement; Network utilisation	Stakeholder support; Collaborative solutions; Regulatory navigation
Selective Bricolage	Strategic combination of creative utilisation with targeted resource acquisition	Strategic discrimination; Balanced approach; Investment prioritisation	Strategic resource focus; Efficiency with effectiveness; Growth management	Strategic clarity; Resource optimisation; Sustainable development

Table 3.2 - Types of Organisational Bricolage and Crisis Applications. Adapted from Baker & Nelson, 2005

Crisis-driven bricolage emerges when extreme conditions force rapid resource recombination and creative problem-solving that may reveal hidden resource potential whilst accelerating innovation cycles (Senyard et al., 2014). Crisis conditions often eliminate normal resource acquisition possibilities whilst creating urgent requirements for creative resource application that transcends traditional resource boundaries. The intensity of crisis bricolage may accelerate learning about resource possibilities whilst building confidence in creative resource utilisation that provides foundation for ongoing strategic development.

Frugal Innovation and Constraint-Driven Value Creation

Frugal innovation represents a systematic approach to value creation under resource constraint that emphasises functionality optimisation, cost reduction, and accessibility enhancement rather than feature maximisation or premium positioning (Radjou & Prabhu, 2015; Bhatti & Ventresca, 2013). This challenges traditional assumptions about innovation requiring substantial resource investment whilst demonstrating how constraint can stimulate creative problem-solving that achieves superior customer value through focused functionality delivery and cost structure optimisation.

The theoretical foundations of frugal innovation draw from multiple disciplines including engineering design, development economics, and strategic management to create integrated frameworks for constraint-driven innovation (Cunha et al., 2014; Tiwari & Herstatt, 2012). Frugal approaches typically involve systematic elimination of non-essential features, optimisation of core functionality, and innovative cost reduction that enables broad market access whilst maintaining value proposition integrity. This requires deep understanding of customer needs combined with engineering creativity that achieves functionality through simplified rather than sophisticated approaches.

Frugal innovation principles include affordability through cost-conscious design, accessibility enabling broad market reach, and sustainability emphasising resource efficiency and environmental responsibility (Radjou & Prabhu, 2015). These principles guide innovation development whilst creating value propositions that may be superior to traditional approaches through enhanced customer value and reduced resource requirements. The

integration of these principles requires systematic design thinking that balances functionality, cost, and sustainability considerations throughout innovation development processes.

Organisational capabilities for frugal innovation include constraint-driven creativity, resource optimisation skills, customer empathy enabling needs identification, and systematic design thinking that achieves functionality through simplicity (Cunha et al., 2014). These capabilities appear learnable through experience and training rather than representing fixed organisational characteristics, suggesting that frugal innovation capability can be systematically developed through appropriate organisational design and capability building efforts.

The relationship between frugal innovation and strategic advantage reveals how constraint-driven approaches can create competitive positioning through cost leadership, market accessibility, and sustainability advantages that may be difficult for resource-abundant competitors to replicate (Bhatti & Ventresca, 2013). Frugal innovation may enable market entry and competitive positioning that transcends traditional resource-based advantages whilst creating sustainable competitive advantages through design philosophy rather than resource superiority.

Crisis applications of frugal innovation demonstrate how extreme constraint can accelerate frugal development whilst revealing hidden innovation potential that may not emerge under normal resource abundance conditions (Tiwari & Herstatt, 2012). Crisis-driven frugal innovation often involves rapid prototyping, stakeholder collaboration, and experimental learning that compresses traditional development cycles whilst achieving breakthrough functionality through constraint-driven creativity. The learning from crisis frugal innovation may provide foundation for ongoing innovation capability that creates lasting competitive advantages.

Crisis-Driven Resource Innovation

Crisis conditions create distinctive contexts for resource innovation through environmental pressure, resource constraint intensification, and time limitations that force rapid experimentation and creative resource utilisation (Wenzel et al., 2020; Kraus et al., 2020).

Crisis-driven innovation often involves radical departures from traditional resource applications whilst enabling discovery of hidden resource potential that may not be apparent under normal operating conditions. Understanding these crisis innovation mechanisms appears crucial for explaining how some organisations achieve transformation rather than mere survival through crisis exposure.

Crisis resource pressure forces systematic evaluation of all available resources whilst encouraging consideration of novel applications and combinations that may create strategic opportunities (Baker & Nelson, 2005). This comprehensive resource assessment can reveal hidden capabilities whilst stimulating creative thinking about resource utilisation possibilities. Crisis pressure may also reduce cognitive constraints that limit innovation under normal conditions by creating existential motivation for creative problem-solving.

Emergency resource mobilisation during crisis periods often involves rapid partnership development, stakeholder engagement, and resource sharing arrangements that transcend normal resource boundaries (Kapucu & Demiroz, 2017). Crisis conditions can accelerate relationship formation whilst creating mutual dependencies that enable resource access and collaborative problem-solving. These emergency mobilisation capabilities may provide foundation for sustained resource innovation and partnership development beyond crisis periods.

Resource substitution and improvisation become critical capabilities during crisis periods when traditional resources may be unavailable whilst environmental demands require maintained operational effectiveness (Bingham & Eisenhardt, 2011). Crisis improvisation often reveals alternative resource applications whilst demonstrating organisational resilience and adaptive capacity. The learning from crisis improvisation may enhance ongoing resource innovation capability whilst providing confidence for future constraint navigation.

However, crisis resource innovation also faces significant challenges including time pressure limiting experimentation, stress affecting creative capability, and stakeholder relationship disruption constraining collaborative resource development (Wenzel et al., 2020). The effectiveness of crisis resource innovation appears contingent on pre-existing organisational

capabilities, stakeholder relationship quality, and adaptive capacity that enable rapid response whilst maintaining strategic coherence.

Emergent Strategy Formation and Dynamic Capabilities

Theoretical Foundations of Emergent Strategy

Emergent strategy formation challenges traditional strategic planning assumptions by proposing that effective strategies often develop through experimental learning, adaptive response, and bottom-up innovation rather than top-down analytical planning and systematic implementation (Mintzberg, 1994; Burgelman, 1991). This perspective emerged from empirical observation that successful organisational strategies frequently diverge significantly from original strategic plans, whilst many breakthrough innovations and competitive advantages arise through unplanned experimentation and serendipitous discovery rather than deliberate strategic design (Quinn, 1980; Mintzberg & Waters, 1985). The implications for uncertainty navigation are profound, suggesting that strategic effectiveness under volatile conditions may require capability for strategy emergence rather than strategy implementation.

Mintzberg's (1994) distinction between deliberate and emergent strategy provides analytical frameworks for understanding how strategic development occurs through interaction between intended strategic direction and adaptive response to environmental feedback and learning opportunities. Deliberate strategies emerge through formal planning processes that establish clear objectives, resource allocation plans, and implementation procedures designed to achieve predetermined outcomes. Emergent strategies develop through organisational learning, experimental action, and adaptive response that creates strategic patterns without explicit planning or formal design processes.

This perspective suggests that strategic effectiveness may depend more on capability to integrate planning with learning than on accuracy of initial strategic analysis or comprehensiveness of implementation planning (Mintzberg & Waters, 1985). The integration challenge becomes particularly complex during uncertainty periods when environmental volatility requires continuous adaptation whilst maintaining strategic coherence and organisational direction.

Strategic learning theory emphasises that strategy formation involves continuous experimentation, feedback interpretation, and adaptive modification that enables strategy improvement and environmental alignment over time (Crossan et al., 2011; Bapuji & Crossan, 2020). Learning-based strategy formation treats strategic development as ongoing process rather than discrete planning activity, enabling continuous improvement through systematic reflection on action consequences and environmental responses. This learning orientation appears particularly valuable during uncertainty periods when initial strategic assumptions may prove inadequate whilst requiring ongoing modification based on experience and feedback.

However, emergent strategy formation also faces significant challenges including lack of strategic direction, resource allocation difficulties, coordination problems, and accountability concerns that may impair organisational effectiveness (Andersen, 2004). Pure emergence without strategic guidance may result in strategic drift or contradictory initiatives that dissipate organisational resources whilst failing to create competitive advantage. The optimal balance between deliberate planning and emergent adaptation appears contingent on environmental characteristics, organisational capabilities, and strategic context that affect the relative value of planning versus learning approaches.

Dynamic Capabilities Theory and Strategic Adaptation

Dynamic capabilities theory extends resource-based thinking to encompass organisational capabilities for resource sensing, seizing, and transformation that enable sustained competitive advantage under changing environmental conditions (Teece et al., 1997; Eisenhardt & Martin, 2000). Unlike ordinary capabilities that enable organisations to perform specific activities effectively, dynamic capabilities enable organisations to modify ordinary capabilities, develop new capabilities, and reconfigure resource bases in response to environmental change whilst maintaining competitive effectiveness. This capability hierarchy suggests that sustainable competitive advantage may depend more on capability development capability than on specific resource or capability superiority.

Teece's (2007) framework identifies three core dynamic capability categories that collectively enable strategic adaptation and competitive advantage maintenance under changing

conditions. *Sensing* capabilities involve systematic environmental scanning, opportunity recognition, and threat identification that enable organisations to detect environmental changes requiring strategic response. *Seizing* capabilities involve strategic decision-making, resource mobilisation, and implementation processes that enable organisations to exploit identified opportunities whilst addressing recognised threats. *Transforming* capabilities involve organisational restructuring, capability reconfiguration, and strategic renewal that enable organisations to maintain competitive effectiveness under fundamentally changed environmental conditions.

Sensing capabilities require sophisticated environmental scanning systems, stakeholder relationship networks, and analytical frameworks that enable early detection of environmental changes whilst distinguishing signals from noise in complex information environments (Teece, 2007; Helfat & Peteraf, 2015). Effective sensing often involves distributed scanning across organisational levels combined with systematic integration processes that create comprehensive environmental understanding. The challenge becomes particularly complex during uncertainty periods when environmental signals may be contradictory whilst requiring rapid interpretation and response.

Seizing capabilities involve rapid decision-making processes, resource mobilisation mechanisms, and implementation systems that enable organisations to exploit opportunities whilst environmental windows remain open (Teece, 2007; Eisenhardt & Martin, 2000). Effective seizing requires balancing speed with accuracy whilst maintaining resource discipline and strategic coherence. The capability becomes crucial during crisis periods when opportunities may emerge rapidly whilst requiring immediate response to achieve competitive advantage.

Transforming capabilities involve fundamental organisational change processes that enable strategic renewal, capability development, and competitive repositioning whilst maintaining organisational identity and stakeholder relationships (Teece, 2007; O'Reilly & Tushman, 2008). Transformation challenges include managing resistance to change, maintaining operational effectiveness during transition periods, and preserving valuable capabilities whilst developing new competencies. These challenges become particularly complex during

crisis periods when transformation may be essential for survival whilst organisational resources are constrained.

Capability Category	Sub-Capabilities	Organisational Requirements	SME Adaptations	Uncertainty Navigation Value
Sensing	Environmental scanning; Opportunity recognition; Technology monitoring; Customer needs assessment	Dedicated scanning resources; Analytical capabilities; External networks; Information systems	Informal networks; Customer proximity; Flexible scanning; Social media monitoring	Early warning systems; Opportunity identification; Threat recognition; Market intelligence
Seizing	Strategic decision-making; Resource mobilisation; Business model design; Investment decisions	Decision-making processes; Resource availability; Planning capabilities; Implementation systems	Rapid decision-making; Owner-manager authority; Flexible implementation; Partnership utilisation	Rapid response capability; Opportunity exploitation; Strategic agility; Market positioning
Transforming	Organisational restructuring; Capability reconfiguration; Strategic renewal; Cultural change	Change management; Leadership capability; Structural flexibility; Learning systems	Structural simplicity; Cultural adaptability; Leadership proximity; Informal learning	Adaptive capacity; Strategic renewal; Competitive repositioning; Organisational development

Table 3.3 - Dynamic Capabilities Framework for SME Uncertainty Navigation. Adapted from Teece, 2007

Dynamic capability integration involves developing organisational capabilities for sense-making evolution, strategic adaptation, and resource innovation that operate synergistically rather than independently (Teece, 2018). Integrated dynamic capabilities enable

organisations to detect environmental changes, adapt strategic approaches, and innovate resource utilisation simultaneously whilst maintaining strategic coherence and competitive effectiveness. This integration may represent fundamental competitive advantage source that enables sustained effectiveness under uncertain conditions.

Temporal Learning and Dynamic Capabilities

The temporal dimension of uncertainty navigation capability development reveals how sustained exposure to challenging conditions creates learning accumulation that enhances organisational potential through progressive capability enhancement rather than simple adaptation or recovery (Crossan et al., 2011; Langley et al., 2013). This process perspective challenges static conceptions of uncertainty navigation as fixed organisational characteristic, instead treating it as dynamic capability that develops sophistication through practice whilst creating organisational memory that provides resources for future challenge navigation.

Temporal learning accumulation operates through several mechanisms including experiential knowledge capture, capability validation through successful challenge navigation, confidence development through demonstrated competence, and framework sophistication through exposure to diverse uncertainty conditions (Bapuji & Crossan, 2020). These mechanisms interact to create learning spirals where each uncertainty navigation experience enhances capability for future challenges whilst building organisational confidence and strategic sophistication that enables increasingly ambitious responses to environmental challenges.

The integration of temporal learning with dynamic capability development suggests that uncertainty navigation effectiveness emerges through sustained practice rather than discrete training or planning activities (Teece, 2018). This perspective implies that organisations seeking to enhance uncertainty navigation capability should actively seek challenging experiences whilst developing systematic processes for capturing and integrating learning from these experiences into organisational capability and strategic development.

Process-based capability development involves systematic attention to how capabilities evolve through experience whilst creating organisational routines and frameworks that enable learning capture and integration (Zollo & Winter, 2002). The process perspective

emphasises that capability development requires deliberate management attention rather than emerging automatically from challenging experiences, suggesting that uncertainty navigation capability represents learnable organisational competency rather than natural organisational characteristic.

This has particular relevance for SME uncertainty navigation, where resource constraints, structural flexibility, and entrepreneurial orientation create distinctive contexts that may require different theoretical applications than large organisation frameworks typically assume (Davidsson et al., 2020). SMEs often possess inherent advantages for uncertainty navigation including decision-making speed, structural flexibility, stakeholder proximity, and entrepreneurial orientation that may enable superior adaptive response despite resource limitations.

Resource constraint implications for the integrated framework suggest that SMEs may achieve superior uncertainty navigation through creative resource utilisation and collaborative relationship development that transcends individual organisational boundaries (George, 2005). The combination of bricolage capabilities with effectuation logic may enable SMEs to achieve strategic effectiveness that exceeds resource-based predictions whilst creating competitive advantages through constraint-driven innovation and adaptive response capability.

The concept of antifragile development through crisis exposure suggests that organisations capable of integrated uncertainty navigation may emerge stronger from crisis experience rather than simply recovering to pre-crisis performance levels (Derbyshire, 2016). This development occurs through accelerated learning cycles, enhanced capability development, expanded stakeholder relationships, and increased confidence in uncertainty navigation that creates lasting competitive advantages and strategic positioning improvements.

The temporal dimension of crisis-driven development reveals how sustained crisis exposure creates learning accumulation that enables increasingly sophisticated crisis navigation whilst building organisational confidence and capability that provides foundation for continued strategic development (Rerup, 2009). This learning accumulation may represent crucial competitive advantage source that enables sustained effectiveness under uncertain

conditions whilst creating organisational capabilities that transcend crisis-specific applications.

Theoretical Gaps and Future Research Directions

The literature review reveals significant theoretical fragmentation across sense-making, strategic adaptation, and resource innovation domains that limits comprehensive understanding of organisational uncertainty navigation whilst creating opportunities for theoretical integration that could advance both academic understanding and practical effectiveness (Teece, 2018; Sirmon et al., 2011). Current theoretical development often treats these domains as separate phenomena requiring distinct analytical frameworks and empirical methodologies, potentially missing crucial interaction effects and synergistic relationships that may determine uncertainty navigation effectiveness.

Sense-making research has developed sophisticated understanding of cognitive processes and interpretive frameworks whilst providing limited insight into how sense-making connects with strategic development and resource utilisation during uncertainty periods (Sandberg & Tsoukas, 2015). The cognitive focus of sense-making research may underestimate the importance of strategic and resource factors that affect interpretive effectiveness whilst missing opportunities to understand how strategic and resource considerations shape sense-making processes. This limitation becomes particularly pronounced during crisis periods when cognitive, strategic, and resource challenges interact simultaneously.

Strategic adaptation research has emphasised emergent strategy formation and dynamic capabilities whilst providing insufficient attention to sense-making processes that enable environmental understanding and resource innovation mechanisms that enable strategic implementation under constraint conditions (Eisenhardt & Martin, 2000). The strategic focus may overestimate organisational capacity for strategic choice whilst underestimating cognitive and resource limitations that constrain strategic options. This limitation appears particularly relevant for SME contexts where resource constraints significantly affect strategic development possibilities.

Resource innovation research has developed understanding of creative resource utilisation and constraint-driven innovation whilst providing limited insight into sense-making processes that enable resource opportunity recognition and strategic frameworks that guide resource development priorities (Baker & Nelson, 2005). The resource focus may underestimate the importance of cognitive and strategic factors that affect resource innovation effectiveness whilst missing opportunities to understand how resource capabilities shape strategic and cognitive development.

These theoretical fragmentations create analytical limitations that may constrain understanding of organisational uncertainty navigation whilst missing opportunities to develop integrated frameworks that could provide superior explanatory power and practical guidance (Pratt et al., 2020). The need for theoretical integration appears particularly urgent for understanding contemporary uncertainty navigation, where digital transformation, globalisation, and environmental volatility create complexity that exceeds traditional theoretical boundaries.

Additionally, current research methodologies in uncertainty navigation literature exhibit limitations that constrain theoretical development whilst creating opportunities for methodological innovation that could advance understanding of dynamic processes underlying organisational uncertainty navigation (Gehman et al., 2018; Langley et al., 2013). The predominance of cross-sectional research designs and retrospective case studies may systematically misrepresent the temporal dynamics and process complexity that characterise uncertainty navigation whilst missing opportunities to observe capability development and learning accumulation as they occur.

Cross-sectional research limitations include inability to capture temporal dynamics of capability development, learning processes, and strategic evolution that appear crucial for understanding uncertainty navigation effectiveness (Ployhart & Vandenberg, 2010). Cross-sectional designs may also suffer from outcome bias that focuses on successful cases without understanding the processes through which success emerges or the conditions that enable transformation rather than failure under similar environmental conditions. These limitations appear particularly problematic for understanding dynamic capabilities and emergent strategy formation that develop through temporal processes.

Where, retrospective research limitations include memory bias affecting accuracy of process accounts, post-hoc rationalisation creating coherent narratives that may not reflect actual decision-making processes, and survivor bias focusing on successful organisations whilst missing learning opportunities from failure cases (Huber & Power, 1985). Retrospective approaches may also underestimate the confusion, contradiction, and experimentation that characterise uncertainty navigation whilst overemphasising strategic coherence and systematic development.

Process research opportunities include longitudinal designs that capture uncertainty navigation as it develops, real-time data collection that reduces retrospective bias, and multi-level analysis that examines individual, organisational, and ecosystem factors simultaneously (Langley et al., 2013). Process methodologies could provide insight into temporal learning accumulation, capability interaction effects, and conditions that enable transformation versus survival under extreme uncertainty. However, process research also faces significant challenges including access difficulties, data collection complexity, and analysis requirements that may exceed traditional research capabilities.

Furthermore, the literature review reveals significant gaps in understanding SME-specific uncertainty navigation mechanisms that may differ substantially from large organisation patterns whilst requiring theoretical frameworks that account for resource constraints, structural flexibility, and entrepreneurial orientation that characterise SME contexts (Davidsson et al., 2020; Herbane, 2019). Current theoretical frameworks often assume resource availability, formal structures, and professional management that may not characterise SME operating conditions whilst underestimating unique capabilities that SMEs may possess for uncertainty navigation.

Resource constraint implications for uncertainty navigation remain inadequately understood, particularly regarding how resource limitations affect sense-making capability, strategic option availability, and innovation processes whilst potentially creating advantages through forced creativity, efficiency pressures, and stakeholder collaboration that larger organisations may struggle to achieve (George, 2005; Baker & Nelson, 2005). The relationship between constraint and capability development appears complex, with resource limitations potentially

forcing creative problem-solving and adaptive response that creates lasting competitive advantages through enhanced organisational flexibility and innovation capability.

Research opportunities include investigating how resource constraints shape sense-making processes through focused attention and collaborative interpretation, affect strategic development through effectuation logic application and emergent strategy formation, and influence resource innovation through bricolage behaviour and frugal innovation adoption. Understanding these constraint-capability relationships appears crucial for developing SME-specific theoretical frameworks whilst providing insights that may benefit larger organisations seeking enhanced innovation and adaptability through constraint introduction.

Lastly, the COVID-19 pandemic has provided unprecedented insights into practical uncertainty navigation whilst revealing both the potential and limitations of theoretical frameworks for guiding organisational response to extreme uncertainty (Kraus et al., 2020). Understanding how organisations can capture learning from crisis experience whilst building capability for future uncertainty navigation appears crucial for advancing both theoretical understanding and practical effectiveness of organisational uncertainty navigation in contemporary business environments.

Conclusion

This comprehensive examination of sense-making theory, strategic adaptation mechanisms, and resource innovation processes reveals the complex cognitive, strategic, and operational capabilities that enable organisational uncertainty navigation whilst highlighting significant opportunities that could advance understanding of how organisations develop sophisticated uncertainty navigation competencies. The literature demonstrates that effective uncertainty navigation requires dynamic integration of interpretive capabilities, strategic flexibility, and resource creativity that operate synergistically rather than independently, challenging traditional theoretical boundaries and organisational design assumptions.

The literature review establishes that sense-making processes provide cognitive foundations for uncertainty navigation through identity construction, retrospective learning, environmental enactment, and collective interpretation that enable coherent action despite

incomplete information and contradictory environmental signals. However, sense-making effectiveness depends on integration with strategic development processes that translate interpretive understanding into actionable initiatives whilst maintaining adaptive capacity for learning and modification based on feedback and experience. This cognitive-strategic integration appears particularly crucial during crisis periods when interpretive frameworks may require reconstruction whilst strategic responses demand immediate action.

Strategic adaptation mechanisms, particularly effectuation logic and emergent strategy formation, provide frameworks for strategic development under uncertainty that emphasise means-driven action, experimental learning, and adaptive response rather than comprehensive planning and systematic implementation. These approaches appear particularly valuable for resource-constrained organisations operating under volatility where traditional planning assumptions become inadequate whilst requiring rapid adaptation to environmental change. However, strategic adaptation effectiveness depends on resource innovation capabilities that enable implementation of strategic initiatives through creative resource utilisation and collaborative resource development.

Resource innovation processes enable organisations to transcend traditional resource constraints through creative recombination, strategic partnerships, and capability development that creates competitive advantages from limitation rather than abundance. These processes appear particularly important for SME uncertainty navigation, where resource constraints represent permanent operating conditions rather than temporary challenges requiring defensive response. However, resource innovation effectiveness depends on sense-making capabilities that enable opportunity recognition and strategic frameworks that guide resource development priorities whilst maintaining competitive coherence.

The identification of significant theoretical gaps such as fragmented frameworks limiting comprehensive understanding, methodological limitations constraining process investigation, and inadequate SME-specific theory development, provides clear directions for future research that could advance both theoretical understanding and practical effectiveness of organisational uncertainty navigation. The COVID-19 pandemic has created opportunities for empirical investigation of these processes whilst highlighting the urgent

need for theoretical frameworks that can guide organisational development of uncertainty navigation capabilities.

Chapter four: Research Methodology

Introduction

This chapter presents the methodological framework underpinning this investigation into how high-growth potential Scottish SMEs developed crisis management capabilities during the COVID-19 pandemic from March 2020 to March 2021. The research employed a purely inductive qualitative approach utilising longitudinal case study methodology to capture the dynamic evolution of sense-making processes and strategic decision-making across six enterprises experiencing extreme uncertainty. The COVID-19 pandemic created a unique natural experiment in organisational crisis management, offering researchers unprecedented access to observe enterprises navigating extreme uncertainty in real-time whilst experiencing sustained disruption across multiple temporal phases. Unlike typical crisis events that affect specific sectors or regions with relatively clear beginning and end points, the pandemic created universal, simultaneous impact across all economic sectors whilst extending over prolonged periods that required sustained adaptive responses rather than discrete crisis management interventions.

This combination of universal impact, extended duration, and real-time accessibility created ideal conditions for investigating how crisis management capabilities develop through temporal learning accumulation rather than static responses to environmental disruption. This chapter justifies the philosophical foundations, research design choices, data collection methods, analytical approaches in attempt to come closer to answering the overarching research questions of this study:

1. *"How do high-growth potential Scottish SMEs make sense of extreme crisis conditions and develop crisis management and decision-making capabilities that enable organisational enhancement beyond pre-crisis potential?"*

2. *"How do crisis management capabilities evolve across five temporal phases in high-growth potential Scottish SMEs to enable survival and progressive organisational enhancement?"*

The selected research questions driving this investigation centre on understanding how high-growth potential Scottish SMEs make sense of and respond to extreme crisis conditions through patterned practices of crisis management, and how decision-making processes and crisis management practices evolve across different temporal phases of extreme crisis events. These process-oriented questions inherently concern meaning construction, interpretive development, and capability evolution rather than measurement of predetermined variables or testing of existing theoretical propositions. The focus on understanding dynamic processes of organisational development under extreme uncertainty necessitated methodological approaches capable of capturing evolving phenomena whilst maintaining analytical rigour through systematic comparison and temporal analysis.

Based on the previous chapters, that reviewed traditional crisis management literature, the predominant focus on large organisations and retrospective analysis of discrete crisis events can be seen. Thus, providing insufficient theoretical foundation for understanding SME responses to extended uncertainty characterised by continuous environmental fluctuation and multiple waves of disruption. Existing frameworks emphasising damage limitation, recovery to normalcy, and defensive response patterns proved inadequate for explaining the strategic transformation, capability enhancement, and antifragile development observed across the six enterprises investigated. This theoretical insufficiency validated the choice of purely inductive methodology designed to generate new understanding from empirical observation rather than testing existing theoretical propositions that might constrain recognition of emergent phenomena.

Additionally, the methodology needed to accommodate the dynamic nature of crisis conditions where participant understanding of their situations evolved continuously throughout the data collection period, requiring analytical approaches that could capture changing interpretations whilst identifying underlying patterns and developmental mechanisms. This temporal sensitivity proved crucial for understanding how sense-making processes evolved from initial cognitive disruption through strategic reorientation to sophisticated environmental construction capabilities that enabled proactive crisis management rather than reactive adaptation.

The methodological choices also needed to address ethical considerations unique to crisis research including participant wellbeing during stressful periods, confidentiality requirements for sensitive organisational information, and voluntary participation principles whilst maintaining research relationships across extended engagement periods. These ethical dimensions required systematic attention to participant autonomy, data protection, and research boundary maintenance whilst enabling the deep analytical engagement necessary for understanding complex organisational phenomena under extreme uncertainty.

Research Philosophy and Paradigm

Philosophical Positioning: Interpretivism and Social Constructivism

This research is grounded in an *interpretivist philosophy* with *social constructivist* underpinnings, recognising that organisational reality is socially constructed through the meanings and interpretations that participants create through their experiences (Berger & Luckmann, 1966; Burrell & Morgan, 1979). This philosophical stance proves particularly appropriate for investigating sense-making processes during crisis conditions, as it acknowledges that participants actively construct meaning from their experiences rather than simply discovering predetermined organisational realities (Weick, 1995; Maitlis & Christianson, 2014).

The choice of interpretivism emerged from the research questions' focus on understanding *how* enterprises make sense of extreme uncertainty and *how* their decision-making processes evolve across temporal phases. These questions inherently concern meaning construction and interpretation rather than objective measurement of predetermined variables. The interpretivist approach enabled investigation of the complex cognitive and social processes through which enterprise representatives constructed understanding of crisis conditions and developed adaptive responses.

The social constructivist perspective proved essential for understanding how enterprises collectively constructed meaning about crisis conditions through ongoing interactions with stakeholders, institutional bodies, and market environments. This philosophical position supported the investigation's findings regarding collaborative sense-making and ecosystem-level capability development, recognising that individual enterprise responses were

embedded within broader social and institutional contexts that shaped interpretive possibilities.

The interpretivist philosophy aligns with the research objectives by acknowledging that crisis management practices emerge through participants' interpretive processes and social interactions rather than through objective environmental conditions (Denzin & Lincoln, 2018). This stance enabled understanding of how the same crisis conditions (COVID-19 pandemic) were interpreted differently across enterprises based on their pre-existing capabilities, sector positions, and stakeholder relationships, leading to diverse but often equally effective crisis management approaches.

Ontological Assumptions: Multiple Realities and Temporal Construction

The research adopts a *relativist ontology* that recognises multiple, socially constructed realities existing simultaneously across different organisational contexts and temporal periods (Guba & Lincoln, 1994). This ontological position proved essential for understanding how the six enterprises experienced different crisis realities based on their sector positioning, resource accessibility, and interpretive capabilities, while acknowledging that these realities evolved continuously across the five identified crisis phases.

The relativist ontology enabled recognition that what constituted 'crisis' varied significantly across enterprises and temporal periods. For essential service enterprises (the associated codes will be introduced later) like high-growth enterprise five (HGE-5) and high-growth enterprise six (HGE-6), crisis reality involved operational adaptation and strategic opportunity evaluation, whilst for hospitality-dependent enterprises like high-growth enterprise four (HGE-4), crisis reality involved existential threat requiring fundamental business model transformation. These different realities were equally valid and required different analytical approaches rather than imposition of uniform crisis definitions.

The temporal dimension required recognition that organisational realities are continuously constructed and reconstructed through ongoing experience, particularly during periods of extreme uncertainty when established frameworks prove inadequate (Langley et al., 2013). This ontological stance supported the investigation's finding that crisis management

capabilities develop through temporal learning accumulation rather than static responses to predetermined environmental conditions. Each enterprise's reality evolved from phase one cognitive disruption through to phase five antifragile capability development, with each phase representing distinct but interconnected meaning constructions. The ontological position also acknowledges that researcher observations and interpretations contributed to the construction of analytical reality rather than simply discovering objective patterns. This recognition influenced methodological choices toward collaborative knowledge construction through sustained dialogue with participants rather than detached observation of predetermined phenomena.

Epistemological Stance: Co-constructed Knowledge Through Dialogue

The research employs a *constructivist epistemology* that views knowledge as co-created through dialogical interactions between researcher and participants rather than discovered through objective observation (Schwandt, 2000). This epistemological stance acknowledges that understanding of crisis management processes emerged through sustained engagement with participants as they navigated uncertainty, enabling capture of evolving sense-making processes and strategic adaptations in real-time. The co-constructive approach proved particularly valuable for investigating organisational phenomena characterised by high uncertainty and rapid change, where participants' understanding of their situations evolved continuously throughout the data collection period. Traditional epistemological approaches that assume stable knowledge objects would have been inadequate for capturing the dynamic nature of crisis management capability development observed across the temporal framework.

The epistemological position supports the research's capacity to capture not only what participants did during the crisis but how their understanding of effective crisis management evolved through accumulated experience and learning. This proved crucial for identifying the mechanisms underlying capability development, particularly the progression from initial cognitive disruption to sense-making competence that enabled proactive environmental construction rather than reactive adaptation. The co-constructive epistemology also acknowledges that the research process itself contributed to participant sense-making through providing structured opportunities for reflection and analysis. The monthly

interviews created spaces for participants to articulate and refine their understanding of their experiences, potentially enhancing their crisis management capabilities through the research engagement itself. This reflexive dimension was embraced as inherent to interpretivist research rather than controlled as potential contamination.

Research Strategy and Design

Inductive Qualitative Approach

This investigation employed a purely inductive qualitative methodology designed to generate theoretical understanding from empirical observations without imposing predetermined theoretical frameworks upon the data (Strauss & Corbin, 1990; Charmaz, 2014). The inductive approach proved essential for investigating crisis management phenomena where existing theoretical frameworks provided limited guidance for understanding organisational responses to unprecedented conditions such as the global pandemic.

The choice of pure induction emerged from initial recognition that existing crisis management literature, predominantly focused on large organisations and retrospective analysis, provided inadequate frameworks for understanding SME responses to extended uncertainty. Traditional crisis management models emphasising damage limitation and recovery to normalcy (Pearson & Clair, 1998; Bundy et al., 2017) proved insufficient for explaining the strategic transformation and capability enhancement observed across the six enterprises.

The purely inductive stance enabled identification of emergent patterns and themes that might not have been visible through deductive hypothesis testing, particularly regarding the temporal development of crisis management capabilities and the integration of value-based decision-making with strategic effectiveness. This approach supported the development of the Crisis Management Capability Development Model through systematic analysis of empirical patterns rather than testing of existing theoretical propositions, which can be found in chapter seven of this thesis.

The inductive methodology facilitated discovery of unexpected findings that challenged conventional crisis management assumptions, including the immediate emergence of value-based decision-making despite resource pressures, the transformation of resource

constraints into competitive advantages, and the development of antifragile characteristics through sustained crisis exposure. These insights would likely have been missed through deductive approaches constrained by existing theoretical expectations. Additionally, the inductive approach also enabled identification of the five temporal phases through empirical observation rather than theoretical predetermination. The phase structure emerged through systematic analysis of participant accounts and temporal pattern recognition rather than application of existing crisis phase models (that mainly focus on pre-crisis, crisis and post-crisis conditions or phases), revealing developmental characteristics unique to SME crisis management during extended uncertainty.

Longitudinal Case Study Methodology

The research utilised multiple longitudinal case study methodology (Yin, 2018; Eisenhardt, 1989) designed to capture organisational development processes across extended temporal periods. The case study approach proved appropriate for investigating complex organisational phenomena within their natural contexts whilst maintaining investigative or analytical rigour through systematic cross-case comparison and temporal process analysis (Gehman et al., 2018). Another reason for adopting such approach is in the nature of this study's research questions being the 'how' type (Yin, 2003). The longitudinal dimension proved crucial for understanding how crisis management capabilities developed through sustained experience and learning accumulation rather than discrete adaptations to specific crisis events. Traditional cross-sectional or short-term longitudinal research would have been inadequate for capturing the temporal learning accumulation processes that enabled progression from initial cognitive disruption to antifragile organisational enhancement.

The multiple case design enabled systematic comparison across diverse organisational contexts whilst maintaining detailed attention to case-specific developmental trajectories (Kumar, Stern and Anderson, 1993). The six cases provided sufficient analytical richness for robust pattern identification whilst remaining manageable for detailed longitudinal analysis across the 12-month data collection period. The case study methodology supported investigation of crisis management as situated practice embedded within specific organisational, sectoral, and institutional contexts rather than universal organisational responses to environmental stimuli. This contextual sensitivity proved crucial for

understanding how different combinations of organisational characteristics, sector positions, and resource attributes shaped varied but often equally effective approaches to crisis management.

The longitudinal case approach also enabled capture of capability development mechanisms that operated across multiple temporal phases, revealing how learning and capability development compounded over time to create enhanced organisational potential rather than simple adaptation to crisis conditions. The longitudinal nature of data collection created substantial analytical richness, with each case contributing approximately twelve (approx. twelve conversations with six individual participants over the twelve-months period) primary data collection points across the temporal framework, resulting in over seventy discrete data collection episodes that provided comprehensive coverage of crisis management evolution across temporal phases.

Temporal Process Research Design

Drawing on temporal process research methodology (Langley et al., 2013), the investigation employed *process-oriented analysis* that treated time as a fundamental dimension of organisational development rather than simply a control variable. The temporal approach enabled identification of developmental phases and capability evolution patterns that revealed the mechanisms underlying crisis management capability development. The temporal process design recognised that organisational phenomena unfold through temporal sequences where early events influence subsequent possibilities, creating developmental trajectories that shape organisational outcomes over time. This perspective proved essential for understanding how initial crisis responses created foundations for subsequent capability development rather than treating each crisis adaptation as independent event.

The process design incorporated real-time data collection that captured organisational changes as they occurred rather than relying on retrospective accounts that might be influenced by hindsight bias or selective memory (Golden, 1992; Miller et al., 1997). Furthermore, the crisis period occurs throughout time and “is a continuing process, there is a need to follow people over a period of time rather than relying solely on retrospect” (Rae,

2000, p. 150). This temporal sensitivity proved essential for understanding sense-making evolution and strategic adaptation processes that occurred rapidly during crisis conditions.

The temporal approach enabled identification of critical junctures and turning points that influenced subsequent developmental trajectories, particularly the progression from phase one cognitive disruption through phase two strategic reorientation to phase three confidence building. These temporal insights would not have been accessible through static analytical approaches that treated crisis management as uniform response patterns. The process orientation also supported understanding of how different temporal rhythms operated simultaneously, with daily operational adaptations occurring alongside monthly strategic evaluations and annual identity reconstructions. In other words, this multi-temporal perspective proved crucial for understanding the complexity of crisis management as organisational phenomenon involving multiple developmental processes operating across different temporal scales. Below is the overview table 4.0 with the research design summary table.

Component	**Approach/Choice**	**Justification**
Research Philosophy	Interpretivism with Social Constructivism	Understanding sense-making processes during crisis
Research Strategy	Purely Inductive Qualitative	Generate theory from empirical observations
Research Design	Longitudinal Multiple Case Study	Capture temporal development processes
Data Collection	Semi-structured monthly Interviews	Balance structure with flexibility for emergent themes
Analysis Approach	Inductive Thematic Analysis	Identify patterns without predetermined frameworks
Temporal Framework	12 months (March 2020 - March 2021)	Cover a large portion of intensified crisis cycle

Table 4.0 - Research Design Summary Table, Author, 2024

Research Context and Case Selection

Context Selection: COVID-19 as Natural Experiment and Institutional Partnership

Research initiation preceded crisis emergence, with data collection originally scheduled to commence in the second quarter of 2019 when COVID-19 conditions had not yet materialised. The initial research focus centred on understanding growth management processes and strategic development in high-growth potential Scottish SMEs, with emphasis on venture development challenges and growth aspiration realisation under normal market conditions. Crisis emergence during data collection created an unexpected transformation in research focus when COVID-19 conditions unfolded approximately four months into the longitudinal data collection process. This timing coincidence provided unprecedented research opportunity whilst requiring substantial methodological adaptation to capture crisis-induced changes in strategic priorities and operational approaches.

The COVID-19 pandemic provided a unique natural experiment in organisational crisis management, offering unprecedented access to observe enterprises navigating extreme uncertainty in real-time (Kraus et al., 2020; Kuckertz et al., 2020). The pandemic's sudden onset, global scale, and extended duration created ideal conditions for investigating crisis management capability development through sustained exposure to uncertainty and disruption. In other words, the transition from growth focus to crisis management investigation occurred naturally as participating enterprises shifted from pursuing growth opportunities to managing existential challenges and strategic adaptation requirements. This evolution enabled observation of how growth-oriented enterprises adapted their strategic thinking and capability deployment when confronted with extreme uncertainty requiring fundamental operational and strategic transformation.

The natural experiment characteristics of COVID-19 included simultaneous impact across all economic sectors, enabling comparative analysis whilst controlling for temporal and environmental variables. Unlike typical crises that affect specific industries or regions, the pandemic created universal disruption that enabled investigation of organisational responses across diverse contexts under consistent external conditions. The pandemic's extended duration proved particularly valuable for investigating temporal learning accumulation and

capability development processes that required sustained observation periods. Previous crisis research has typically focused on discrete events with clear beginning and end points, limiting understanding of how organisational capabilities evolve through sustained uncertainty exposure.

The Scottish context provided additional analytical advantages through its distinctive institutional support ecosystem, policy approaches to crisis management, and SME characteristics that enabled investigation of institutional relationship development and collaborative ecosystem evolution. The Scottish Government's systematic approach to crisis support and route map development created consistent institutional framework whilst allowing variation in enterprise responses and institutional engagement strategies. The geographic focus ensured consistency in regulatory environment and support system characteristics whilst maintaining enterprise diversity across sectors and organisational characteristics. This combination of environmental consistency with organisational diversity proved ideal for identifying common developmental patterns whilst understanding contextual variations in crisis management approaches.

This investigation emerged from a collaborative research partnership with Highlands and Islands Enterprise (HIE), the Scottish Government's economic and community development agency responsible for supporting enterprise development across Scotland's most geographically diverse and economically challenging region. HIE's operational territory encompasses over half of Scotland's landmass, extending from Shetland to Argyll and from the Outer Hebrides to Moray, serving communities and enterprises across remote islands, highland areas, and rural economies that face distinctive developmental challenges and opportunities (HIE, 2021).

The partnership with HIE provided unique research advantages through access to their High Growth Management portfolio, a selective programme supporting enterprises with demonstrated growth potential and strategic ambitions. This institutional relationship enabled identification of enterprises that met specific criteria for high-growth potential whilst ensuring consistent access to professional development support that might influence crisis management capabilities. The partnership also provided contextual understanding of institutional support systems and policy frameworks that shaped enterprise crisis

experiences. The institutional partnership also provided access to comprehensive support ecosystem understanding, as HIE enterprises typically engage with multiple development organisations including Skills Development Scotland, specialist training providers, Chambers of Commerce, and sector-specific support agencies. This ecosystem engagement created opportunities for investigating collaborative crisis management and institutional relationship development beyond single-agency interactions.

Shared growth orientation across all participating enterprises emerged from their HIE engagement rather than representing predetermined selection bias, as HIE's mandate focuses specifically on supporting enterprises with growth potential and expansion aspirations. This common strategic orientation provided analytical foundation whilst acknowledging that growth ambitions might influence crisis management approaches through enhanced strategic thinking and resource acquisition capabilities.

Case Selection Criteria: High-Growth Potential SMEs

Case selection criteria incorporated HIE engagement requirements, with all participating enterprises actively engaged with dedicated account managers within HIE's support framework and receiving growth-oriented development assistance. This common institutional relationship provided analytical consistency whilst ensuring that all enterprises had access to professional advice and support resources that might enhance their crisis management capabilities beyond purely autonomous responses. The case sample comprised six enterprises across diverse sectors, each demonstrating high-growth potential characteristics whilst representing different organisational sizes, strategic orientations, and crisis exposure patterns. Below table 4.1 highlights High-Growth Enterprises key background information that covers what section/industry they operate in and primary activities and strategies. For clarity, enterprise and participant codes stand for instance: HGE-... for high-growth enterprise and ER-... for entrepreneurial participant.

Enterprise/Participant Code	Foundation Year	Size Category	Industry Sector	Primary Activities	Strategic Focus	Crisis Exposure Level
HGE-1/ER-1	August 2006	Small	Technology & Advanced Engineering	Specialist drainage contractor; CCTV surveys; preventative maintenance for domestic, commercial & industrial markets	Venture growth, capital increase, technical capabilities development, investment opportunities	High - operational adaptation required
HGE-2/ER-2	Early 2013	Medium	Food & Drinks, Tourism	Gin production distillery; on-site tourist shop; distillery tours & tastings; online sales	Innovation support, international expansion, specialist business advice	Very High - tourism dependency
HGE-3/ER-3	Late 2014	Small	Engineering & Product Development	Industrial process engineering design; production engineering; R&D in natural sciences & engineering	Business knowledge development, investment access, technical innovation	Medium - B2B focus
HGE-4/ER-4	September 2019	Small	Creative Industries, Luxury Bedding	Production of luxury duvets, pillows & cashmere accessories	Business knowledge, specialist advice, investment opportunities	Very High - luxury market disruption
HGE-5/ER-5	Mid-1958	Medium	Construction	Gravel & sand pit operations; clay & kaolin mining; ready-	Business knowledge, specialist advice, investment access	Low-Medium - essential services

				mixed concrete; domestic & civil engineering construction		
HGE-6/ER-6	Start 2004	Medium	Food Production	Processing & preserving fish, crustaceans & molluscs	Business knowledge, specialist advice, expansion opportunities	Medium - food supply chain

Table 4.1 - High-Growth Enterprises key background information. Author, 2024.

The selection framework deliberately incorporated enterprise maturity diversity, with three early-stage enterprises (HGE-1, HGE-2, HGE-4) and three mature-stage enterprises (HGE-3, HGE-5, HGE-6) identified through HIE's High Growth Management department to enable comparative analysis across different organisational development stages. This maturity variation enabled investigation of how pre-existing organisational characteristics influenced crisis management approaches whilst maintaining focus on growth-oriented enterprises

The six-case sample size follows established guidelines for qualitative case study research, where Eisenhardt (1989) recommends 4-10 cases for theory building to balance analytical depth with pattern recognition capabilities, whilst Yin (2018) emphasises analytical richness over statistical representativeness for understanding complex organisational phenomena. The sample size enabled detailed longitudinal analysis of each case whilst supporting robust cross-case comparison and pattern identification across diverse organisational contexts. Fewer cases would have limited analytical richness and cross-case validation, whilst more cases would have exceeded analytical capacity for detailed longitudinal investigation across extended temporal periods. The sample size proved adequate for theoretical saturation, where additional cases were unlikely to reveal fundamentally new patterns or challenge existing theoretical insights. The diversity within the six-case sample enabled identification of both common developmental mechanisms and contextual variations that enriched theoretical understanding whilst maintaining analytical manageability.

The purposeful sampling approach prioritised analytical richness and theoretical relevance over statistical representativeness, following established qualitative research principles that emphasise understanding complex phenomena through detailed investigation of information-rich cases (Patton, 2015). The approach balanced practical accessibility through institutional partnership with analytical requirements for diverse organisational contexts and crisis experiences. with strategic ambitions. Purposeful sampling was employed to select six high-growth potential Scottish SMEs based on specific criteria designed to ensure analytical richness and theoretical relevance whilst maintaining focus on enterprises with strategic ambitions and adaptive capabilities that might enable sophisticated crisis management responses. This diversity enabled cross-case analysis whilst maintaining focus on high-growth potential characteristics, revealing how different organisational contexts shaped crisis

management approaches whilst identifying common developmental mechanisms across diverse circumstances. The selection criteria included:

Selection Criterion	Specific Requirements	Rationale	Exclusions
Growth Potential	Pre-crisis growth trajectories; Strategic expansion plans; Innovative capabilities; High-growth potential indicators	Enable investigation of enterprises with strategic ambitions and adaptive capabilities	Established enterprises focused solely on operational maintenance; Stable enterprises without growth aspirations
Size Classification	Small to medium enterprises; Fewer than 250 employees; SME context consistency	Ensure appropriate organisational scale for SME-focused research whilst maintaining analytical manageability	Micro-enterprises with extremely limited resources; Large enterprises with extensive crisis management infrastructure
Sector Diversity	Cross-sectoral representation; Growth-oriented enterprises; Strategic business orientations	Enable comparative analysis across different industry contexts whilst maintaining growth focus	Traditional SME sectors characterised by lifestyle business orientations; Purely operational enterprises
Strategic Orientation	Evidence of strategic thinking; Innovation activities; Entrepreneurial orientation; Adaptive response capabilities	Identify enterprises capable of sophisticated crisis management responses	Purely operational focus enterprises; Established market/practice focus without strategic development
Geographic Location	Scottish-based enterprises; Consistent institutional context; Embedded within Scottish business support ecosystem	Ensure regulatory and institutional consistency whilst accessing distinctive support frameworks	Enterprises outside Scottish jurisdiction; Limited institutional engagement

Crisis Exposure	Significant crisis impact experienced; Substantial adaptation requirements; Strategic response necessities	Ensure analytical relevance for crisis management investigation	Minimal disruption enterprises; Business-as-usual capability maintenance
Accessibility & Commitment	12-month longitudinal engagement; Monthly interview participation; Substantial time investment willingness	Enable comprehensive temporal analysis across extended crisis period	Limited availability enterprises; Short-term engagement preferences
Communication Capability	Articulate experience sharing; Detailed reflection capabilities; Rich analytical insight provision	Ensure data quality adequate for theoretical development	Purely operational reporting; Limited analytical or reflective capability

Table 4.2 - Case Selection Criteria for High-Growth Potential Scottish SMEs, Author, 2024

However, a few sampling and case selection limitations are worth acknowledging now, although, this will be further highlight in the chapter's limitations section. Such limitations include potential survival bias favouring enterprises with enhanced adaptive capabilities or resource positions that enabled sustained research participation throughout challenging crisis periods. Enterprises experiencing severe crisis impacts might have been less likely to maintain research engagement, potentially creating optimistic bias in findings regarding crisis management effectiveness. Additionally, the institutional partnership influence on sampling requires recognition that HIE-supported enterprises might demonstrate different crisis management characteristics than purely autonomous SMEs without access to professional development support and institutional relationships. This institutional context shaped findings whilst providing insights about collaborative crisis management approaches.

Geographic concentration within HIE support territory provided consistency in institutional context whilst potentially limiting generalisability to other regional or national contexts with different support systems, policy frameworks, or economic characteristics. The Scottish policy environment and institutional approach to crisis support influenced enterprise experiences in

ways that might not apply elsewhere. Sector diversity within the sample enabled cross-sectoral analysis whilst acknowledging that deeper sector-specific investigation might reveal additional insights about industry-specific crisis management approaches and capability development patterns.

The sampling approach prioritised analytical depth over breadth, focusing on comprehensive understanding of capability development processes across six enterprises rather than broader but shallower investigation across larger samples. This trade-off enabled detailed temporal analysis whilst acknowledging limitations in statistical generalisability that are inherent in qualitative case study research. Practical constraints influenced sampling through participant availability, willingness to engage in extended research relationships, and capacity to maintain regular interview schedules during crisis periods. These constraints shaped sample characteristics whilst enabling identification of enterprises with sufficient analytical capability and communication skills for detailed investigation. The sampling framework successfully identified enterprises capable of providing rich analytical insights into crisis management capability development whilst acknowledging that different sampling approaches might yield alternative theoretical insights or challenge findings through investigation of different organisational contexts or crisis experiences.

Data Collection Methods

Semi-Structured Interview Approach

Data collection employed semi-structured interviews conducted on a monthly base with key participants from each enterprise throughout the March 2020 to March 2021 period. The semi-structured approach balanced systematic data collection across cases with flexibility to explore emerging themes and participant-specific experiences (Kvale & Brinkmann, 2015). The choice of semi-structured interviews proved appropriate for investigating dynamic organisational phenomena where participant experiences and interpretations evolved continuously throughout the data collection period. Structured interviews would have been too rigid for capturing emergent themes and unexpected developments, whilst unstructured interviews would have lacked systematic coverage across cases and temporal periods. The choice of qualitative interview methodology proved particularly appropriate for

entrepreneurship and crisis management research, addressing methodological limitations identified in existing literature where quantitative approaches have traditionally dominated despite their inadequacy for understanding complex contextual and social phenomena (McDonald et al., 2015).

The interview approach was designed as guided conversations rather than formal interrogations, enabling participants to share their experiences naturally whilst ensuring coverage of key research themes including sense-making processes, strategic decision-making, resource management, stakeholder relationships, and capability development. This conversational approach proved particularly valuable for capturing evolving participant understanding and interpretation of their crisis experiences. The semi-structured format enabled responsive questioning that followed up on participant observations and explored emerging themes whilst maintaining consistency in core inquiry areas across all interviews. This balance proved crucial for capturing both systematic patterns and case-specific insights that enriched theoretical understanding. Where the monthly frequency (covering the period from March 2020 to March 2021) provided sufficient temporal resolution to capture significant developments whilst avoiding participant fatigue or excessive demands on enterprise representatives managing crisis conditions. The regular contact also enabled identification of gradual changes that might have been missed through less frequent data collection approaches. Crisis management during extreme uncertainty represents precisely the type of complex, contextual phenomenon requiring exploratory investigation through methods capable of capturing nuanced experiences and evolving interpretations that quantitative approaches cannot adequately address.

Interview Protocol Development and Evolution

Interview participants comprised six SME owner-managers who maintained operational responsibility during the COVID-19 crisis whilst possessing sufficient strategic oversight to provide comprehensive insights into enterprise responses, decision-making processes, and capability development. The focus on owner-managers ensured access to participants with both operational knowledge and strategic perspective necessary for understanding crisis management as integrated organisational phenomenon.

The conversational interview format employed open-ended questions designed to encourage natural dialogue whilst ensuring systematic coverage of key research themes. This approach balanced structure necessary for cross-case comparison with flexibility required for exploring participant-specific experiences and emergent themes that might not have been anticipated through predetermined questioning approaches. Interview duration varied between 20-60 minutes depending on participant availability and the complexity of developments since previous interviews, with longer discussions typically occurring during periods of significant organisational change or strategic adaptation. This flexible approach accommodated participant constraints during crisis periods whilst ensuring adequate depth for analytical purposes. The interview protocol was developed through iterative (again and again) refinement based on conversations that started in March 2020 and April 2020, essentially disregarding everything discussed prior to this period as it became obsolete and irrelevant. This iteration was associated with ongoing analysis of emerging themes throughout the data collection period, that was happening simultaneously as data was being collected.

The protocol evolved systematically across temporal phases to incorporate emerging themes whilst maintaining consistency in core inquiry areas. Early interviews focused heavily on immediate crisis impact and adaptation responses, whilst later interviews incorporated increasing attention to learning integration, capability development, and strategic transformation. This adaptive approach enabled capture of developmental processes whilst ensuring systematic data collection across all cases and temporal periods. The protocol refinement process itself contributed to theoretical development through identifying emergent themes and analytical priorities. Below table 4.3 highlights more detailed interview protocol, identifying precise questions asked each participant throughout the longitudinal period. More interview questions can be found in appendix three and four.

Month/Year	**Interview Questions**	**Key Focus Areas**
March 2020 *PM announces the first lockdown in the UK,*	1. What is the most recent update from you, regarding your business? What crisis impact you are current experiencing? 2. What help and support does HIE provide you with right now? 3. What are the most recent resources that you looked for/ thought you needed?	Crisis response, support needs, expectations

ordering people to "stay at home". Lockdown measures legally come into force	4. Any growth-related changes within your business? 5. What is the current crisis impact? How is your business currently doing?	
April 2020 *Scottish Government announces several business relief funding opportunities. Lockdown extended for "at least" three weeks*	1. Given the fact how everything is changing now, so is the new way you formulate your problems? How has it changed? 2. How are you adapting to the new reality? Enterprise wise. 3. What are your pivoting strategies? 4. Have your business/business model changed? 5. What resources are you currently looking for? 6. Do you seek for support and resources anywhere else? 7. What are your most recent business growth related changes?	Routine updates, collaboration status, growth developments, adaptation
May 2020	1. Since the last time we have talked, was there any new challenges that appeared in your business? 2. Could you please tell me a bit more about any new projects as a result of pivot? 3. What are your most recent business growth related changes? 4. Did you formulate any new problems that happened in your business in the last few weeks? 5. Would you say that your main task is just to get the business back up running the way it was?	Business pivot and recovery, support types, relationship changes, problem formulation, support scenarios
June 2020 *Scottish Government publishes a Covid - 19 Routemap*	1. Can you tell me what has been going on in the last few weeks? 2. In the last few weeks or in the last month, anything new that happened within your business? 3. How do you frame your sort of support requests? How does the process usually work?	Request processes, resource access, business reopening planning, support

	4. How does the resource access works? You would usually put a proposal? Is it generally hard to access resources? 5. Did you implement any new support? 6. What do you find most beneficial now with the Coronavirus? Is there any kind of support that you found particularly beneficial?	implementation, crisis support evaluation
July 2020	1. Would you be able to identify three direct resources, that you needed because of the crisis impact? 2. Given the partial reopening, what plans do you have in place? 3. How has your business changed because of the restrictions? What resources you need? 4. What is the main update you have about your business?	Operational status, resource requests, main objectives assessment, achievement evaluation, communication patterns, value proposition
August 2020	1. Any new developments? New projects? 2. What has happened in the last month? 3. And how is the business in general, given the ease of restrictions? 4. What resources are you currently looking for? 5. Any pivoting updates? What decisions you recently made?	Crisis management, project outcomes, gaps, general business status, recovery progress, resource types
September 2020 *Lockdown restrictions eased further; Scottish Government announced that*	1. Any new developments? New projects? 2. What has happened in the last month? 3. And how is the business in general, given the ease of restrictions? 4. What resources are you currently looking for? 5. Any pivoting updates? What decisions you recently made?	Crisis management, project outcomes, gaps, general business status, recovery

Scotland is to remain in Phase 3 of the route map		progress, resource types
October 2020	1. Any new developments? New projects? 2. What has happened in the last month? 3. And how is the business in general, given the ease of restrictions? 4. What resources are you currently looking for? 5. Any pivoting updates? What decisions you recently made?	Crisis management, project outcomes, gaps, general business status, recovery progress, resource types
November 2020	1. Any new plans? 2. Any new resources that you have asked or is it just like all sort of the ones that we have discussed in the last few months? 3. What are intangible like advice resources that HIE providing at this moment? If any? 4. Are there any new challenges that you have like faced? 5. Any new developments? New projects? 6. What is the main update you have about your business?	Communication patterns, resource requests, intangible support
February/March 2021 *In January Mainland Scotland goes into another national lockdown*	1. One of the usual questions is what's the most recent update in the last couple of months. 2. And in terms of any new resources that you need/needed, was there anything new in the last two three months? 3. Any updates on the business pivoting activities? What are you trying to do? 4. Given the fact that we have entered the second national lockdown in Scotland, so compared to the first one, how well was your business prepared for it? 5. Over the last 12 months that we have been communicating, what changes happened in your business? Did your perspective change in the last ten-twelve months?	Comprehensive review, future planning, achievement goals, business pivoting, impact assessment, communication challenges, crisis learning, future planning, strategic direction

	6. What resources were the most useful/important/essential to your enterprise? 7. What's the biggest lesson that you've learned because of the Covid crisis and did your perspective changed in any way? Are there are key things that you are trying to focus on and trying to achieve? 8. And last month, when we were talking, pretty much other companies were saying that their growth aspirations and growth plans are put away for now and they are in the survival mode. So, has that changed now? Are you back to growth aspirations or you are still in survival mode?	

Table 4.3 – Interview questions protocol organised by month, Author 2024

Audio-recorded interviews lasting approximately 20-60 minutes each were conducted according to participant availability and the complexity of developments since previous interviews. Interview duration varied based on participant circumstances, with shorter interviews during particularly challenging periods and longer interviews when significant developments warranted detailed exploration. All interviews were conducted over the phone/skype/zoom platforms due to COVID-19 restrictions, which paradoxically provided enhanced access to participants who might otherwise have been difficult to reach for regular face-to-face meetings. The virtual format enabled consistent interview scheduling despite travel restrictions whilst reducing time demands on participants managing crisis conditions. The virtual format also facilitated recording and transcription processes whilst providing participants with familiar technology platforms that enabled comfortable conversation environments. Technical difficulties were minimal, and participants quickly adapted to virtual interview formats that became normalised during pandemic conditions.

Interview scheduling aimed for monthly frequency whilst maintaining flexibility to accommodate participant availability and significant organisational developments that warranted additional data collection. The approach resulted in 72 primary interviews across the six cases, with temporal distribution averaging 12 interviews per case but varying based on enterprise-specific developments and participant availability, thus resulting in

approximately 2,000 recorded interview minutes. Additional brief check-ins and clarification conversations were conducted as needed to capture significant developments between scheduled interviews or clarify complex issues requiring follow-up exploration. These supplementary interactions provided temporal richness whilst respecting participant time constraints during challenging periods. Below table 4.4 highlights the protocol incorporated several core inquiry areas whilst maintaining flexibility for participant-driven exploration:

Inquiry Area	Question Focus	Analytical Purpose
Current Situation Assessment	Recent developments; Current challenges; Immediate priorities	Contextualise participant experiences; Provide chronological updates since previous interviews
Sense-Making Exploration	Crisis condition interpretation; Environmental change understanding; Strategic option comprehension	Investigate cognitive adaptation mechanisms; Capture interpretive framework evolution
Decision-Making Analysis	Recent decisions examination; Decision-making processes; Resource allocation choices; Strategic adaptations	Reveal evolution in strategic thinking and capability development
Stakeholder Relationship Examination	Customer interactions; Supplier relationships; Institutional body engagement; Support system utilisation	Understand relationship evolution and collaborative sense-making processes
Learning and Capability Reflection	Capability development analysis; Learning outcome assessment; Enhanced confidence recognition	Capture retrospective sense-making and capability recognition
Future Orientation and Strategic Planning	Strategic planning investigation; Opportunity identification; Anticipated development exploration	Reveal prospective sense-making and strategic development

Table 4.4 - Interview Protocol Structure and Inquiry Areas, Author 2024

Transcription was completed monthly following each round of interviews, enabling immediate analysis of emerging themes whilst memories remained fresh, and patterns could be identified across concurrent case developments. This systematic approach to transcription timing proved crucial for maintaining analytical momentum whilst enabling identification of cross-case patterns as they emerged. The transcription process involved verbatim conversion of audio recordings into text documents, preserving participant language, expressions, and conversational flow rather than creating polished or edited versions. This approach maintained authenticity of participant voice whilst enabling detailed analysis of language use, metaphors, and interpretive frameworks employed by participants.

Initial analysis occurred immediately following transcription through systematic review of each interview for relevant quotes, emerging themes, and significant developments related to COVID-19 decision-making and crisis management responses. This immediate analysis enabled identification of themes requiring follow-up exploration in subsequent interviews whilst maintaining theoretical sensitivity throughout data collection. The analysis process involved systematic identification and clustering of relevant quotes into thematic categories that evolved throughout the data collection period. Early themes focused on immediate crisis responses and adaptation mechanisms, whilst later themes incorporated capability development, learning integration, and strategic transformation patterns. This will be further discussed in the next section. The sample (word-to-word) interview transcript can be found in appendix five.

Supplementary Data Sources

While interviews constituted the primary data source, comprehensive supplementary materials were systematically collected to provide essential contextual understanding and enable structured documentation of COVID-19's evolving impact on SMEs throughout the crisis period. The supplementary data strategy created a comprehensive contextual framework that supported interpretation of participant experiences within broader policy, economic, and institutional developments.

Spatial contextualisation was achieved through collecting diverse perspectives from enterprise representatives across Scotland's varied geographic contexts, enabling

understanding of how location-specific factors influenced crisis experiences whilst revealing common patterns across different regional settings. This geographic diversity provided insights into rural-urban variations and sectoral concentrations that shaped enterprise responses. Temporal contextualisation occurred through systematic documentation of evolving conditions throughout the March 2020 to March 2021 crisis period, creating a structured chronological framework that enabled understanding of how changing external conditions influenced enterprise adaptation and capability development processes. Where the contextual depth was enhanced through multiple data sources that provided comprehensive understanding of the broader environment within which enterprises operated, including policy frameworks, economic conditions, institutional responses, and sectoral impacts that shaped enterprise strategic options and adaptive responses.

Crisis management policy documents provided essential chronological documentation of government responses, policy evolution, and institutional framework development that shaped the external environment within which enterprises operated. These documents enabled construction of detailed policy timeline that contextualised enterprise responses within broader governmental crisis management approaches. Publicly disseminated content documenting critical crisis events provided temporal markers and impact assessments that enabled understanding of how external developments influenced enterprise strategic environments. This content created structured narrative of crisis evolution from institutional and policy perspectives.

COVID-19 support documentation including grant specifications, policy announcements, and programme guidelines provided understanding of institutional support evolution and resource availability that influenced enterprise strategic options throughout different crisis phases. Economic impact documentation enabled construction of comprehensive economic context that demonstrated the magnitude and sectoral variation of crisis impacts, providing foundation for understanding enterprise responses within broader economic disruption patterns. The following documentary sources provided structured contextual framework for understanding COVID-19's rolling impact on SMEs across multiple dimensions:

Government Crisis Response Evolution:

- Cabinet Office (2021), COVID-19 Response – Spring 2021 (Roadmap)
- Cabinet Office (2021), COVID-19 Response: Autumn and Winter
- The UK Government (2022), COVID-19 Response: Living with COVID-19
- The UK Government (2022), COVID-19 Financial Support for Businesses

Economic Impact Progression:

- Office for National Statistics (2021), GDP Quarterly National Accounts, UK: July to September 2021
- Office for National Statistics (2022), Coronavirus (COVID-19) Latest Insights: Infections
- Harari and Keep (2021), Coronavirus: Economic Impact by House of Commons

International Context and Comparative Framework:

- International Monetary Fund (2020), The IMF's Response to COVID-19
- OECD (2020), COVID-19 Crisis Response in Southeast European Economies
- OECD (2020), Economic Outlook June 2020
- OECD (2020), Government Support and the Covid-19 Pandemic

Sectoral Impact Analysis:

- Food and Drink Federation (2020), Covid-19: The Impact of the Incident on Food and Drink Manufacturing
- United Nations World Tourism Organisation (2020), International Tourist Numbers Could Fall 60-80% in 2020

Development and Support System Evolution:

- OECD (2018), Global Outlook on Financing for Sustainable Development 2019: Time to Face the Challenge
- IMF and World Bank (2019), List of LIC DSAs for PRGT-eligible Countries

Chronological framework development involved systematic construction of crisis timeline through documentary analysis that mapped policy developments, economic indicators, support programme evolution, and sectoral impacts across the data collection period. This timeline provided structured foundation for understanding enterprise responses within evolving external conditions. **Policy evolution tracking** enabled detailed understanding of how government responses, support programmes, and regulatory frameworks evolved throughout different crisis phases, providing essential context for interpreting enterprise strategic adaptations and institutional relationship development.

Economic impact mapping through statistical documentation created comprehensive understanding of crisis magnitude, sectoral variations, and temporal progression that enabled assessment of enterprise responses within broader economic disruption patterns and recovery trajectories. **Sectoral context construction** through industry-specific reports and impact assessments enabled understanding of how different sectors experienced crisis conditions, enabling interpretation of enterprise responses within appropriate sectoral contexts and competitive dynamics. Understanding sectoral context at times, helped to guide the monthly conversations with the participants.

Analytical integration processes combined interview insights with documentary evidence to develop comprehensive understanding of how external conditions influenced enterprise capability development whilst acknowledging enterprise agency in constructing strategic responses within environmental constraints and opportunities. The comprehensive contextual documentation provided structured re-telling of COVID-19's rolling impact story that enhanced interpretation of enterprise experiences whilst supporting theoretical development through detailed understanding of environmental conditions that shaped crisis management capability development processes. This contextual framework enabled assessment of how enterprise responses related to broader crisis patterns whilst maintaining focus on enterprise-level capability development and strategic transformation processes.

These supplementary sources provided contextual information and enabled verification of participant accounts whilst respecting confidentiality requirements and participant autonomy over disclosure. The materials enriched understanding of enterprise contexts whilst providing triangulation opportunities for key claims and assertions.

Data Analysis Approach

Inductive Thematic Analysis Framework

Data analysis employed inductive thematic analysis (Braun & Clarke, 2006; 2019) designed to identify patterns and themes emerging from the data without imposing predetermined theoretical frameworks. The analysis proceeded through iterative cycles of data immersion, pattern identification, theme development, and theoretical integration, enabling generation of novel insights about crisis management capability development. The inductive approach proved essential for identifying unexpected findings that challenged conventional crisis management assumptions, particularly regarding the immediate emergence of value-based decision-making despite resource pressures, the transformation of resource constraints into competitive advantages, and the development of antifragile characteristics through sustained crisis exposure.

The thematic analysis process involved systematic progression through analytical phases: initial data familiarisation through repeated reading and listening to interviews; systematic coding and identification of interesting features across the entire dataset; searching for themes through pattern recognition and code clustering; reviewing themes for internal coherence and external distinction; defining and naming themes through detailed analysis and exemplar identification; and producing analytical reports that integrated themes into coherent theoretical understanding. The inductive stance enabled identification of themes that emerged from participant experiences rather than researcher preconceptions, supporting development of the Crisis Management Capability Development Model through systematic integration of empirical patterns rather than testing of existing theoretical propositions.

Systematic Temporal Process Analysis

Building on Langley's (1999) temporal process analysis methodology, the investigation employed systematic temporal mapping to identify developmental phases and capability evolution patterns across cases. The temporal analysis involved multiple analytical strategies designed to understand organisational development as temporal process rather than discrete events. Therefore, temporal sensitivity was maintained throughout the analytical process,

with particular attention to how themes evolved across crisis phases and how early experiences influenced subsequent developments. This temporal dimension proved crucial for understanding capability development as dynamic process rather than static organisational characteristics.

Chronological event mapping created detailed timelines for each enterprise that identified significant developments, decisions, adaptations, and capability changes across the data collection period. These enterprise-specific timelines were then compared to identify common temporal patterns and divergent developmental trajectories. Furthermore, sequence of events analysis examined how early events influenced subsequent possibilities and outcomes, revealing developmental trajectories where initial responses created foundations for enhanced capabilities. This analysis proved crucial for understanding how cognitive disruption in phase one enabled strategic reorientation in phase two and subsequent capability development.

This analysis also focused on turning points and significant moments that influenced subsequent developmental trajectories, particularly transitions between developmental phases and breakthrough moments in capability recognition or strategic confidence. Where the comparison across cases enabled identification of common developmental mechanisms whilst understanding contextual variations that shaped different pathways through crisis phases. This comparative approach revealed how similar developmental processes manifested differently across diverse organisational contexts. See appendix six for manual data analysis and identification of COVID-19 related common and divergent patterns and themes of decision-making and sense-making related actions across selected enterprises.

Cross-Case Pattern Analysis

Cross-case analysis (Miles et al., 2014; Eisenhardt, 1989) enabled identification of common patterns and theoretical insights whilst maintaining sensitivity to case-specific contexts and developmental trajectories. The analysis employed systematic comparison techniques designed to balance pattern recognition with contextual sensitivity. Pattern matching involved systematic comparison of themes, mechanisms, and developmental processes across cases to identify common elements that transcended specific organisational contexts.

This analysis revealed five core mechanisms underlying capability development: Cognitive Development Trajectory, Value-Resource Integration, Resource Innovation Acceleration, Learning Accumulation Process, and Ecosystem Integration Evolution that will be discussed in great detail in chapter seven.

Additionally, the contextual analysis examined how organisational characteristics, sector positions, and resource endowments influenced crisis management approaches whilst identifying underlying mechanisms that operated across diverse contexts. This analysis revealed how common developmental processes manifested differently across varied organisational circumstances. Where the theoretical Integration synthesised empirical patterns into coherent theoretical understanding through systematic relationship identification between themes, mechanisms, and developmental processes. Contextual variation acknowledgement ensured that pattern identification did not obscure important differences in how common mechanisms manifested across diverse organisational contexts.

The analysis distinguished between universal developmental processes and context-specific manifestations that enriched rather than contradicted theoretical insights. Here for instance, early-stage enterprises (HGE-1, HGE-4) both experienced complete cognitive disruptions requiring fundamental framework reconstruction, whilst mature enterprises (HGE-5, HGE-6) maintained analytical capabilities that enabled systematic crisis evaluation and strategic patience. Or technology-enabled enterprises (HGE-2, HGE-3) achieved rapid capability reorientation through existing technological infrastructure, whilst resource-constrained enterprises (HGE-1, HGE-4) required more fundamental strategic transformation that ultimately enabled greater identity reconstruction and strategic enhancement.

The analysis employed constant comparative methodology (Charmaz, 2014) with continuous iteration between data collection and analysis throughout the research period. This approach enabled theoretical development whilst maintaining analytical rigour through systematic comparison and integration processes. Emerging theme identification occurred during ongoing data collection, enabling real-time recognition of significant patterns and analytical priorities that guided subsequent inquiry focus. This responsive approach ensured that developing theoretical insights received adequate empirical exploration whilst maintaining systematic coverage. For instance, comparative mechanism identification focused on

underlying processes that enabled capability development rather than surface-level similarities in enterprise responses. Whilst HGE-3's production of medical equipment and HGE-2's digital channel focus appeared different at operational levels, both demonstrated resource innovation mechanisms that transformed constraints into competitive advantages through creative recombination and strategic repositioning.

Thematic analysis examined how similar themes emerged across different enterprises despite varying sectors, organisational sizes, and crisis exposures. For instance, the emergence of value-based decision-making appeared consistently across all six enterprises regardless of their pre-crisis strategic orientations or resource positions, suggesting fundamental cognitive processes that transcend organisational characteristics during extreme uncertainty. Where temporal pattern recognition across cases revealed consistent developmental trajectories despite different starting points and organisational contexts. All enterprises progressed through similar phases of cognitive disruption, strategic reorientation, integration, enhancement, and mastery, though the specific content and timeline varied based on enterprise-specific factors and crisis exposure intensity. Again, important to acknowledge contextual variations and ensure that pattern identification did not obscure important differences in how common mechanisms manifested across diverse organisational contexts. The analysis attempted to distinguish between universal developmental processes and context-specific manifestations that enriched rather than contradicted theoretical insights.

Ethical Considerations

Institutional Approval and Informed Consent

The research received full ethical approval from the Strathclyde University Research Ethics Committee prior to data collection commencement, ensuring compliance with institutional ethical standards and professional research guidelines whilst providing framework for responsible research conduct. Informed consent was obtained from all participants through detailed explanation of research purposes, data collection procedures, time commitments, confidentiality measures, and voluntary participation principles. The consent process emphasised participant autonomy whilst ensuring clear understanding of research involvement and participant rights. The consent procedures explicitly acknowledged the

longitudinal nature of participation, and the substantial time commitment involved in monthly interviews across the 12-month period, whilst emphasising voluntary withdrawal rights at any time without prejudice or negative consequences. This transparency proved essential for maintaining ethical relationships during extended engagement periods. The participant information sheet and company's consent form can be found in appendix sections one and two.

Consent processes emphasised participant autonomy over information sharing and recognised the sensitive nature of crisis-period organisational information. Participants maintained control over which information could be shared and used in research outputs, with explicit acknowledgement that commercial sensitivity and competitive concerns might limit disclosure in certain areas. Ongoing consent verification occurred throughout the data collection period, with regular reminders of participant rights and opportunities to modify or withdraw consent as circumstances changed. This dynamic consent approach acknowledged that participant comfort levels might evolve during extended crisis periods.

Voluntary participation principles were rigorously maintained throughout the research process, with explicit acknowledgement that the longitudinal nature of the investigation represented substantial commitment from participants during particularly challenging circumstances. The extended 12-month data collection period during crisis conditions required sustained engagement that participants could withdraw from at any point without prejudice or negative consequences. Initial participant recruitment involved eight enterprises that expressed willingness to engage in the longitudinal investigation, demonstrating the challenges of securing and maintaining research participation during periods of organisational uncertainty and increased operational demands. The recruitment process emphasised voluntary engagement whilst clearly communicating the substantial time commitment and regular interview requirements involved in meaningful longitudinal research participation.

Two participants' voluntary withdrawal occurred from the original cohort, reflecting the importance of maintaining genuine voluntary participation principles rather than pressuring enterprises to continue involvement when circumstances made participation difficult or inappropriate. The first enterprise withdrew prior to the crisis emergence, citing changed organisational priorities and strategic focus that made research participation less relevant to

their immediate needs. With a crisis-period withdrawal involved one other enterprise that initially participated through early crisis phases but subsequently decided to discontinue involvement approximately two months after crisis onset. This withdrawal reflected the additional pressures and uncertainties that crisis conditions created for enterprise management, making research participation secondary to immediate survival and adaptation priorities.

Withdrawal respect demonstrated commitment to ethical research principles that prioritised participant wellbeing and autonomous decision-making over research convenience or data collection completeness. The withdrawal processes were handled sensitively whilst ensuring that departing participants retained positive relationships and future engagement possibilities should circumstances change.

Confidentiality and Anonymisation

Strict confidentiality protocols were maintained throughout data collection and analysis, with participant identities protected through comprehensive anonymisation procedures designed to prevent identification whilst preserving analytical value and authentic voice representation. Enterprise identification codes (HGE-1 through HGE-6) replaced company names throughout all research outputs, whilst sector descriptions balanced analytical context with identity protection through general rather than specific industry classifications that might enable identification through elimination processes.

Additionally, participant quotes were carefully edited to remove identifying information including specific company names, location details, customer references, and unique circumstantial details whilst preserving analytical meaning and authentic voice characteristics. This editing process required careful balance between anonymisation and authenticity. Contextual information was generalised where necessary to prevent identification whilst maintaining analytical value, with specific financial figures, employee numbers, and geographic details modified, or ranges provided rather than precise figures that might enable identification.

Data storage protocols employed secure, encrypted systems with restricted access and systematic backup procedures, whilst interview recordings were destroyed following transcription and verification to minimise long-term identity exposure risks. The anonymisation approach enabled rich analytical description whilst providing robust identity protection that acknowledged the sensitive nature of crisis-period organisational information and potential competitive implications of strategic details.

Vulnerable Population Considerations

Particular attention was paid to participant wellbeing during data collection, recognising that crisis periods create additional stress and emotional burden that required sensitive research approaches and flexible engagement protocols. Interview scheduling remained flexible to accommodate participant needs and stress levels, with explicit acknowledgement that crisis management responsibilities took precedence over research participation when scheduling conflicts emerged. This flexibility proved essential for maintaining ethical relationships whilst recognising participant priorities. When participants were unable to engage during scheduled periods, subsequent longitudinal intakes were modified to compensate for missed sessions whilst maintaining temporal continuity and analytical coherence. In such instances, the interview transcript would say '*no contact with company representative*' to maintain transparent analytical records whilst protecting participant confidentiality.

Interview content remained sensitive to emotional impact of crisis experiences, with careful attention to participant comfort levels and willingness to discuss challenging topics including redundancies, business failures, and personal stress impacts. Interviews could be paused or rescheduled when participants experienced emotional distress. Research boundary maintenance ensured that interviews remained focused on organisational experiences rather than personal therapy, whilst acknowledging that reflection opportunities might provide beneficial perspective on challenging experiences without creating inappropriate dependency relationships.

Participants were consistently reminded that research participation was entirely voluntary and that prioritising their wellbeing over research engagement was not only acceptable but encouraged when crisis conditions created excessive demands on their time and emotional

resources. Furthermore, comprehensive data protection measures ensured compliance with the General Data Protection Regulation requirements whilst providing robust security for sensitive organisational information shared during crisis periods when competitive positioning and strategic planning details might have enhanced commercial value. Data minimisation principles guided collection and retention practices, ensuring that only information directly relevant to research objectives was collected and retained, whilst excess personal or organisational details were excluded from transcription and analytical processes.

Lastly, retention and disposal schedules provided clear timelines for data destruction following research completion, whilst enabling appropriate retention periods for potential follow-up research or verification requirements within ethical boundaries. The data protection framework acknowledged that crisis-period organisational information might have enhanced sensitivity due to competitive implications and strategic value, requiring additional security measures beyond standard research protocols.

Methodological Contributions and Limitations

This research provided unique real-time access to enterprises navigating extreme uncertainty, enabling capture of sense-making evolution and capability development as they occurred rather than relying on retrospective accounts potentially influenced by hindsight bias or selective memory. Therefore, this investigation makes several significant methodological contributions to crisis management research through innovative approaches to real-time longitudinal data collection, temporal process analysis, and theoretical integration under extreme uncertainty conditions. These methodological innovations not only enabled the empirical findings presented in this thesis but also provide frameworks for future research investigating organisational phenomena under unprecedented conditions.

Crisis-concurrent data collection represented a methodological innovation that captured organisational development during extreme uncertainty rather than reconstructing experiences after crisis resolution. Traditional crisis research typically investigates organisational responses months or years after crisis events, when participant memories may be influenced by outcome knowledge and subsequent experiences. This investigation

captured participant understanding and strategic reasoning as they evolved through sustained uncertainty exposure.

Additionally, real-time sense-making documentation enabled observation of interpretive framework reconstruction and cognitive adaptation processes that might be difficult to access through retrospective accounts. Participants shared their confusion, uncertainty, and evolving understanding as they experienced it rather than providing sanitised accounts of strategic decision-making processes that appeared more coherent in hindsight than they felt during crisis conditions. Temporal sensitivity maintenance throughout data collection enabled capture of gradual changes and developmental processes that might be overlooked through snapshot approaches or compressed into simplified before-after comparisons. The monthly interview frequency provided sufficient temporal resolution to identify turning points, developmental phases, and capability evolution patterns whilst avoiding participant fatigue during challenging periods.

Natural experiment maximisation through COVID-19's universal impact enabled comparative analysis across diverse organisational contexts under consistent external conditions, providing analytical control that would be difficult to achieve through typical organisational research approaches. The pandemic's simultaneous onset across all sectors and geographic regions created unique opportunities for understanding organisational responses under extreme uncertainty. Crisis timing coincidence with research commencement provided unique opportunity to observe organisational development from crisis onset through multiple phases without requiring retrospective reconstruction of early experiences that participants might struggle to remember accurately or completely.

However, the research focused specifically on high-growth potential Scottish SMEs, which may limit transferability to other SME categories including lifestyle businesses, family enterprises, or survival-oriented ventures that might demonstrate different crisis management characteristics and capability development patterns. The focus on high-growth potential enterprises may have introduced selection bias toward organisations with enhanced adaptive capabilities, strategic sophistication, or resource positions that enabled more successful crisis navigation than might be typical across broader SME populations. The sectoral diversity within the sample enabled cross-sectoral analysis but may have limited

depth of understanding about sector-specific crisis management approaches that might provide additional insights about contextual influences on capability development processes.

Scottish institutional context and policy environment may have influenced findings in ways that would not apply to other regional or national contexts with different support systems, regulatory frameworks, or cultural approaches to crisis management and institutional relationships. As the geographic concentration within Scotland provided consistency in institutional context but may have limited exposure to different regulatory environments, support systems, or cultural approaches to crisis management that might influence capability development patterns.

Furthermore, the March 2020 to March 2021 timeframe captured intensive crisis development but did not extend to longer-term post-crisis evolution or sustained antifragile development validation that might provide additional insights about capability persistence and continued organisational enhancement. Where the COVID-19 crisis characteristics represent a unique form of extreme uncertainty involving global scope, extended duration, and health dimensions that may not generalise to other crisis types including financial crises, technological disruptions, or competitive threats with different uncertainty profiles.

The pandemic's universal impact enabled comparative analysis but may have limited understanding of how enterprises respond to crisis conditions affecting specific sectors or regions whilst leaving other areas relatively unaffected. The inability to conduct site visits or observe organisational operations directly limited contextual understanding that might have enriched analytical insights or challenged participant accounts. Also, virtual interview limitations imposed by pandemic restrictions may have reduced nonverbal communication and observational opportunities that might have enhanced understanding of participant experiences and organisational contexts. It is important to note, that one-year data collection period provided substantial temporal depth but may have been insufficient for capturing longer-term capability development or strategic transformation outcomes that require extended periods for full manifestation.

The purely inductive approach provided flexibility for emergent theme identification and theory development but may have limited analytical depth in areas where existing theoretical

frameworks could have provided additional insight or analytical sophistication. Whilst this approach enabled discovery of unexpected phenomena challenging conventional crisis management assumptions, it potentially overlooked theoretical connections or analytical perspectives that deductive approaches might have revealed through systematic application of established frameworks. Additionally, the single researcher analysis throughout the data collection and interpretation phases may have introduced analytical bias or limited interpretive perspectives that might have been enhanced through collaborative analytical approaches or multiple analyst triangulation. The co-constructive epistemology acknowledges researcher influence as inherent rather than problematic, but alternative analytical perspectives might have identified different patterns or challenged interpretive assumptions that remained unexamined through individual analysis.

Theoretical integration challenges emerged from attempting to synthesise multiple theoretical frameworks dynamically rather than applying single theoretical lenses systematically. Whilst this integration enabled novel insights about theoretical interaction under extreme conditions, it potentially created analytical complexity that obscured individual theoretical contributions or created artificial connections between disparate theoretical domains. Temporal analytical demands of processing longitudinal data across six cases and twelve months created substantial analytical burden that may have limited depth of analysis for individual interviews or developmental phases. The monthly data collection frequency generated rich empirical material but required systematic analytical attention that potentially constrained interpretive sophistication for individual data points or temporal periods.

Interview-based data collection relied heavily on participant self-reports and interpretations that may have been influenced by social desirability bias, where participants presented more positive accounts of their crisis management effectiveness than objective assessment might reveal. The research relationship development across extended periods potentially enhanced this bias through participant desire to demonstrate competence and strategic sophistication to academic researcher. Even though this research attempted to minimise the reliance on retrospective accounts by implementing monthly interview frequency, still, there might have been some influence that affected participant accounts regarding their decision-making

processes and strategic reasoning. even with designed. Participants might have reconstructed their reasoning post-hoc to create more coherent narratives than actually existed during the actual decision-making moments, particularly for complex or emotionally charged experiences. The co-constructive epistemology acknowledges researcher influence on participant responses and analytical interpretation, whilst this was managed through reflexive practice, it represents an inherent characteristic of interpretivist research rather than limitation to be eliminated. Lastly, language and communication barriers may have limited full understanding of participant experiences, particularly around complex technical or strategic concepts that required translation between participant knowledge and researcher understanding.

Conclusion

This methodology chapter has presented the comprehensive research framework underpinning the investigation of crisis management capability development in high-growth Scottish SMEs during COVID-19. The interpretivist philosophical foundation with social constructivist underpinnings provided appropriate epistemological framework for understanding sense-making processes and meaning construction during extreme uncertainty, enabling investigation of how enterprises actively constructed meaning from their crisis experiences rather than simply discovering predetermined organisational realities.

The purely inductive qualitative approach enabled generation of novel theoretical insights without constraining analysis through predetermined theoretical frameworks, proving essential for investigating organisational phenomena where existing theoretical frameworks provided inadequate guidance for understanding responses to unprecedented conditions. This methodological choice facilitated discovery of unexpected findings that challenged conventional crisis management assumptions, particularly regarding the immediate emergence of value-based decision-making despite resource pressures, the transformation of resource constraints into competitive advantages, and the development of antifragile characteristics through sustained crisis exposure.

The longitudinal case study methodology captured complex organisational development processes across extended temporal periods whilst enabling systematic cross-case

comparison that revealed both common developmental mechanisms and contextual variations enriching theoretical understanding. The six-case sample provided sufficient analytical richness for robust pattern identification whilst remaining manageable for detailed longitudinal analysis across the 12-month data collection period, with each enterprise contributing approximately 12 primary data collection points that created comprehensive coverage of crisis management evolution across temporal phases.

The comprehensive supplementary data sources enhanced understanding whilst providing structured contextual framework that enabled interpretation of participant experiences within broader policy, economic, and institutional developments. This contextual documentation created structured re-telling of COVID-19's rolling impact that supported analytical depth whilst maintaining focus on enterprise-level capability development and strategic transformation processes. The temporal process research design proved crucial for understanding capability development as dynamic accumulation process rather than discrete adaptation events, enabling identification of the five crisis phases that emerged through empirical observation rather than theoretical predetermination. This temporal sensitivity revealed developmental characteristics unique to SME crisis management during extended uncertainty whilst demonstrating how sustained crisis exposure created learning accumulation that enabled progression from initial cognitive disruption to sophisticated sense-making competence.

The comprehensive quality and ethical considerations ensured trustworthy and responsible research conduct whilst acknowledging co-constructive knowledge development processes inherent in interpretivist investigation. The systematic attention to credibility through prolonged engagement, member checking, and thick description provided analytical rigour whilst the transferability support through detailed contextual description enabled informed assessment of theoretical relevance to other contexts and situations. The ethical framework prioritised participant wellbeing whilst maintaining research quality through flexible engagement protocols that demonstrated respect for participant autonomy during challenging crisis periods. The comprehensive confidentiality protections and voluntary participation principles ensured responsible research conduct whilst enabling the deep

analytical engagement necessary for understanding complex organisational phenomena under extreme uncertainty.

The methodological approach's innovations in real-time crisis investigation, temporal process analysis, and dynamic theoretical integration provide foundation for future crisis management research whilst demonstrating potential for enhanced theoretical development through sustained empirical engagement during extreme conditions. The crisis-concurrent data collection enabled observation of organisational development during extreme uncertainty rather than retrospective reconstruction, whilst the emergent phase structure discovery challenged traditional frameworks through empirical observation rather than theoretical imposition.

The comprehensive methodological framework supported generation of novel insights about crisis management capability development whilst establishing precedents for investigating organisational phenomena under extreme uncertainty conditions, contributing to both substantive understanding of SME crisis management and methodological advancement in qualitative longitudinal research approaches for complex organisational investigation which will be further explored and discussed in chapters six and seven.

Chapter five: Findings on Crisis Management Practices Across Scottish SMEs

Introduction

From the crisis management literature, it is assumed that ventures go through a linear process of dealing with such adverse situations, and to survive, enterprises need to follow certain steps, including evaluation, interpretation, acceptance, pivoting decision-making and adaptation. However, reality suggests otherwise. The Covid-19 pandemic presented organisations with a continuous challenge of environmental fluctuation, where Governmental bodies would introduce new regulations (at times on a weekly base) impacting their decision-making process, creating even more uncertainty, or changes within the demand and supply chains, accessibility or even enterprise individual circumstances. All this reveals the complex and sometimes not obvious interplay between sense-making processes and adaptive crisis responses.

The Covid-19 pandemic created a unique natural experiment in organisational crisis management. Unlike typical crisis studies that focus on large corporations or examine single time points, this research tracked high-growth SMEs in real-time as they navigated through multiple waves of disruption from March 2020 to March 2021. These enterprises, characterised by their growth potential and entrepreneurial orientation, provided unique insights into how such organisations can develop sophisticated crisis management capabilities. Therefore, this chapter presents the empirical findings from six Scottish SMEs that navigated the Covid-19 pandemic from March 2020 through March 2021, examining how these enterprises made sense of extreme crisis conditions and developed patterned practices of crisis management. Through detailed longitudinal analysis across five critical temporal phases, this chapter reveals the complex interplay between sense-making processes and adaptive crisis responses that enabled organisational survival, learning, and transformation during unprecedented uncertainty.

Through detailed examination of cognitive adaptation mechanisms, interpretive frameworks development, and meaning construction processes, these six cases demonstrate how sense-making and decision-making capability development provided crucial insights into SMEs' crisis response to extreme events. Rather than viewing crisis management as purely operational or

strategic responses, these findings reveal how the chosen enterprises construct meaning from unique and uncertain conditions, develop actionable strategies (given the circumstances), and evolve sense-making capabilities that enable increasingly effective crisis navigation over time.

The narratives and discussions of six cases (six high-growth potential Scottish SMEs) demonstrate the non-linear sensemaking and decision-making processes within each case, along with a representation of the key behaviours exhibited during each trigger stage, where this chapter aims to shed some light on the overarching research question of this thesis-

1. *"How do high-growth potential Scottish SMEs make sense of extreme crisis conditions and develop crisis management and decision-making capabilities that enable organisational enhancement beyond pre-crisis potential?"*

2. *"How do crisis management capabilities evolve across five temporal phases in high-growth potential Scottish SMEs to enable survival and progressive organisational enhancement?"*

All six enterprises experienced the same temporal crisis phases that structured the foundation for this findings chapter and future analysis and discussion chapter. The timeline was selected and identified based on the longitudinally collected data, as well as the analysis of all major governmental announcements in Scotland during that time. The timeline reads as follows:

- March 2020: WHO declares the Covid-19 virus a pandemic. PM announces the first lockdown in the UK, ordering people to “stay at home”. Lockdown measures legally come into force.
- April 2020: Scottish Government announces several business relief funding opportunities. Lockdown extended for “at least” three weeks.
- June 2020: Scottish Government publishes a Covid -19 Routemap to take Scotland through and out of the Covid -19 pandemic. First Minister Nicola Sturgeon announces the move to Phase 1 of the route map out of lockdown, beginning on Friday, 29 May 2020.

- September 2020 Lockdown restrictions eased further, including reopening indoor theatres, bowling alleys and soft play. Scottish Government announced that Scotland is to remain in Phase 3 of the route map, as Covid -19 remains a significant threat to public health.
- January 2021: Mainland Scotland goes into another national lockdown

This shared temporal frame of time enables future cross-case analysis (next chapter) of how sense-making processes and subsequent decision-making evolved across crisis phases while maintaining sensitivity to organisation-specific contexts and adaptive responses.

This chapter is broken down into six subsections (based on the six selected cases), where each section will start with a brief introduction to each enterprise, followed by a detailed discussion of how each enterprise dealt with and responded to a Covid-19 crisis, with rich exemplar quotes to support the findings. Each case will follow the five temporal phases to show sense-making and decision-making evolution while highlighting organisation-specific contexts and reactions that illuminate different aspects of crisis management processes. The analysis and discussion of the selected cases will be presented in the next chapter.

Case one: Potential High-Growth Enterprise one (HGE-1)

A Potential High-Growth Enterprise one was founded in 2006 and operates in the sector of technology and advanced engineering industry. They are a specialist drainage and wastewater solutions, serving clients across Scotland, including regions such as Moray, Aberdeenshire, the Highlands, and the Islands. They provide a comprehensive range of services tailored to domestic, commercial, and industrial clients, such (a) CCTV Drain Surveys by utilising advanced camera technology to inspect and diagnose issues within drainage systems, (b) jetting and pipe cleaning, where high-pressure water jetting used to clear blockages and maintain pipe cleanliness, (c) surface and tank cleaning, drain and sewer blockage removal, (d) pipe repair and rehabilitation, utilising trenchless methods like pipe relining to restore damaged pipelines and (e) surveys, inspection and assessment of manhole conditions and accessibility. The company is known for its 24/7 availability, ensuring rapid response to

emergencies and minimising disruption for clients. This enterprise classified as small, because it employs less than 49 people, and during the Covid-19 lockdown, it was categorised as essential business due to the nature of their services, so it was not required to stop operating completely.

Phase one - Trigger event (March 2020)

Initial Shock and Disorientation with Early signs of Sense-Making and Crisis Framing, and Emerging Resilience Signals

The WHO pandemic declaration and UK's first lockdown created what Weick (1995) identifies as a fundamental sense-making crisis as the breakdown of established interpretive frameworks that had previously enabled coherent organisational action. The onset of Covid-19 in March 2020 brought abrupt disruption to a Potential High-Growth Enterprise 1 *(HGE-1)*, creating a climate of confusion, paused operations, and deep uncertainty. This phase was marked by the initial lockdown announcement and its immediate effects on business continuity. The enterprise representative *(ER-1)* described this period as overwhelming, where the initial response revealed overwhelming cognitive disruption that initiated intense sense-making processes:

"This month was an absolute nightmare as I was trying to stay on top of all the things…before everything got out of hands with the virus.."

This characterisation captures the disorientation and high cognitive load associated with early crisis sense-making. The ER-1 found themselves coping with the steep pace of change and the loss of control, signalling the collapse of previously stable frames of reference.

This statement demonstrates the collapse of "*identity construction*" as the first property of sense-making. The characterisation of March as "*an absolute nightmare*" reveals the breakdown of the participant's established organisational identity, where the phrase "*trying*

to stay on top of all the things" indicates overwhelming sense-making demands that exceeded existing cognitive capabilities.

The temporal reference to "*before everything got out of hands*" illustrates a concept of retrospective sense-making using past experiences as reference points for interpreting present disruption. The ER-1 constructed meaning by contrasting the "before" (normal operations, license course completion, account manager communication) with the "after" (crisis conditions), creating temporal boundaries that enabled basic comprehension of the new reality.

At the operational level, the HGE-1 experienced an immediate interruption of income-generating activity, where such immediate operational disruption showed how sense-making shapes perceived environmental conditions:

"All our orders have been cancelled, with all my staff and workers being sent home for further notice. So, there is nothing in the diary for next week and the week after"

This sudden halt created a limbo situation, where normal operations could no longer continue, but new routines had not yet formed. This response demonstrates third property of sense-making - enactment of sensible environments. The participant's interpretation of order cancellations and staff dismissals formed an environment characterised by complete uncertainty ("*nothing in the diary*"). This sense-made environment then constrained subsequent action possibilities and strategic options. Where the phrase "*for further notice*" reveals attempts to maintain some sense of temporal control and future possibility, even while acknowledging fundamental uncertainty. This demonstrates how sense-making processes seek to preserve agency and actionability even under extreme disruption.

The HGE-1 was formally classified as an essential business, however, this classification was more nominal than practical, as the demand had vanished:

"We are classified as essential business, so technically, we are open for work, but there have been not much of orders"

The impact that was brought on by an initial Covid-19 impact created this tension between formal business eligibility and the absence of actual work, that highlights the ambiguity of crisis for SMEs and frames the enterprise's early attempts at navigational sense-making. This statement illustrates concepts of "extracted cues" and "plausibility rather than accuracy", where ER-1 briefly discussed two contradictory cues - essential business classification versus market demand reality. The sense-making response prioritised actionable interpretation (maintaining operational readiness) over comprehensive understanding of pandemic dynamics. The word "*technically*" mentioned by this participant reveals awareness of the disconnect between regulatory classification and practical reality, demonstrating high cue extraction that recognised multiple conflicting, environmental signals simultaneously.

The ER-1 acknowledged, that while information and updates were being received from external bodies, they offered limited functionality or benefit:

"The help… is quite basic and general, so they are just sending emails with government updates relating to business changes"

This shows the company was situated in an environment where guidance was procedural, not strategic, and the burden of making sense of what to do next remained internalised and present. The HGE-1 was left in a position of interpretive burden, having to translate broad policy signals into meaningful decisions for the business:

"It is quite difficult just now because everything is changing so quickly… I would need to figure out what to do next sometime soon, and there is really no one to help me"

Here, we see a clear example of entrepreneurial sense-making under uncertainty - a solitary process of interpreting evolving environmental cues without clear precedents or templates. The comment that "*there is really no one to help me*" highlights the loneliness of the SME decision-maker in early crisis phases, which aligns with literature on bounded resources and thin support ecosystems in small enterprises during external shocks. This participant's recognition of isolation indicates the loss of external sense-making support systems such as advisors, peers, networks, that had previously contributed to collective meaning construction. This forced increased reliance on individual sense-making capabilities during the most challenging period.

Notably, the entrepreneur also articulated relief about the business's pre-crisis financial posture:

"I am really glad that there are not any big loans and debts in my business. Very challenging times ahead"

This quote reflects a dimension of *frugality* as a pre-existing condition. Rather than reacting with emergency cost-cutting, the firm had already been operating with limited financial liabilities - a condition that inadvertently positioned it better for survival. This reinforces the argument that frugality is not just a response mechanism but a strategic position (Andrews and Khoury, 2020), and in this case one that provided resilience during the most destabilising phase of the pandemic. Furthermore, this suggests retrospective sense-making brought on by this crisis, and about enterprise's resource capabilities, as this demonstrates how crisis conditions prompted retrospective evaluation of previous decisions. The debt-free position was retrospectively sense-made as a crucial resource capability, transforming a previously neutral financial condition into a strategic advantage through crisis-induced re-interpretation. Additionally, the phrase "*very challenging times ahead*" shows prospective sense-making that projected current interpretations into future scenarios, creating temporal coherence that enabled continued action and planning capability.

Furthermore, the entrepreneur acknowledged that all future-oriented activities - particularly growth initiatives - were suspended:

"All my growth plans are obviously on hold now and have been postponed"

This statement indicates a temporary contraction of temporal focus, from long-term planning to immediate problem-solving. In *effectual logic* terms (Sarasvathy, 2001), this represents a shift from *goals-to-means* thinking toward means-driven improvisation, where the entrepreneur must act with what is immediately available rather than pursuing long-range objectives.

Finally, despite the emotional tone of fear and frustration, there is also an emergent sense of adaptation and cautious acceptance of a new reality. While no concrete strategies had yet formed, the narrative already points to and at a resilience mindset, where survival becomes the priority and decision-making is deferred until better clarity emerges.

Phase two- Reorientation and Crisis Layering (April 2020-June 2020)

Pivoting Strategy, Frugality, and Bricolage in Practice

As the pandemic extended into the second quarter of 2020, The HGE-1 began adjusting to the reality that immediate recovery was unlikely. This phase was marked by significant cognitive and strategic reorientation, as the ER-1 reassessed earlier plans, delayed investments, and began exploring more viable alternatives. In the participant's own words:

"Just the Covid-19 is making me reassess the business and what was originally in the plan, I do not think it is going to be feasible"

This signals a deep shift in entrepreneurial sense-making, as the pandemic was not merely seen as a disruption, but as a catalyst for reconsidering the underlying logic of the business model. This demonstrates how crisis experience enabled retrospective sense-making about

previous strategic assumptions, where the recognition that pre-crisis plans were *"not going to be feasible"* shows sense-making that integrated crisis learning with strategic planning, adapting interpretive based on new environmental understanding. Originally planned investments were no longer unrealistic in light of projected workloads:

"For example, the plan was to invest quite heavily in some waste management equipment. We are just not going to have the work to pay for that right now, you know. We are not going to be able to afford to finance the equipment"

This reflects a strong orientation toward affordable loss (Sarasvathy, 2001), a core principle of *effectuation*, where the entrepreneur evaluated options not by ideal returns, but by what could reasonably be risked. The HGE-1 reframed strategic priorities around smaller, more flexible options:

"I need to look at something which is smaller. You know, I need to pivot the business differently. I also want to look at something else which is completely unrelated to our company. But because it is a pie in the sky idea at the moment, I wanted to know a bit more about it"

While no new business model was fully implemented, the ER-1's reflection on alternative paths signals a process of experimentation and thinking. This shows prospective sense-making that constructed new possibility beyond existing business boundaries, where the phrase *"completely unrelated"* demonstrates new opportunities, flexibility and essentially sense-making that expanded interpretation to encompass previously unconsidered options. The characterisation as *"pie in the sky idea"* shows maintained openness to uncertain possibilities while acknowledging their preliminary nature. Additionally, The Scottish Government's business relief announcements created new social sense-making opportunities that partially restored collective meaning construction processes:

"This month, my account manager has been simply sending me updates and progress regarding the Covid crisis and new developments from the Scottish Government. So, at least three times a week, I get an email regarding different funding opportunities, furlough schemes, and general updates"

This response demonstrates the restoration of social sense-making through structured information flows. The regular communication pattern "*at least three times a week*" established new social sense-making routines that enabled ongoing interpretation of rapidly changing conditions. The information diversity (funding opportunities, furlough schemes, general updates) provided multiple cue sources for constructing coherent understanding of government response frameworks. The participant's reflection on external support revealed important identity construction processes:

"Having an account manager for me does make a difference as I am less likely to give up, as I have way more accountability. It also helps to stay on top of things"

This demonstrates how external relationships contributed to identity construction and maintenance during crisis. The concept of "accountability" represents social sense-making that reinforced organisational identity and purpose when individual sense-making resources were strained. The phrase "*less likely to give up*" reveals how social sense-making supported identity construction that highlighted persistence and resilience. The extended lockdown period required appropriate integration of *retrospective learning* with *prospective planning*:

"As a business, we will be okay financially, but we will also take a hit financially because soon, our savings will start getting routed. So, we will definitely need to change direction in my business, so we would need to see how"

This statement illustrates complex sense-making that integrated retrospective assessment (current financial position), present evaluation (taking a hit), and prospective projection (savings depletion). The participant constructed plausible scenarios that balanced optimism *"we will be okay"* with realism *"we will also take a hit",* demonstrating sense-making that highlighted actionable understanding over precise prediction. The recognition that directional change would be necessary shows prospective sense-making that anticipated required adaptations, enabling proactive rather than reactive crisis management.

During this second phase, the Scottish Government became more proactive with their support initiatives, in particular for SMEs, however, the application and the selection process was not always straight forward. The participant's understanding of support access mechanisms revealed further adaptive sense-making about new surrounding business environments:

"There is no really a negotiation process, I would usually ask for something, then submit an application and simply wait. They never promise anything, so it comes down to being qualified"

This insight demonstrates sense-making adaptation to new procedural environments created by crisis support systems. The understanding that *success "comes down to being qualified"* rather than negotiation represents successful sense-making about bureaucratic versus market-based resource allocation mechanisms.

Alongside this strategic pivot, the HGE-1 experienced another external shock - a theft that combined the difficulties introduced by Covid -19. The ER-1 shared the following:

“We were broken into… every single bit of equipment that we need was taken… and the insurance company is saying that as we had keys on-site, we have invalidated our insurance…I am not going to lie. I am still waiting to hear back from the insurance company. So, I really don’t know where we are in terms of what we are doing… It is really hard to say

this right but, if the insurance company come back and say we are not going to pay out because you invalid your insurance, then that is the end of our company"

This quote shows the accumulative nature of crisis in SME contexts, where one shock layers onto another, overwhelming recovery capacity. The founder struggled to even know the enterprise's current position. Despite these setbacks, there were attempts to fulfil contractual obligations:

"We are essentially just carrying on just now, so that we can fulfil all of our contracted work. Once all of that is done, then I am going to have to make a decision about the business"

This moment reflects both resilience and a holding strategy such as carrying on within constraints while postponing strategic commitments until a clearer picture emerged. In essence, the company was improvising based on necessity, demonstrating *bricolage* - doing what it could with the limited resources and conditions at hand (Baker & Nelson, 2005).

As a result of one shock layering onto another, longer-term opportunities were deferred or missed due to overload. The ER-1 had previously been preparing a tender with support from government funding:

"The deadline for that was last Wednesday. I was halfway through that tender and I just didn't manage to submit the tender in time, because of the amount of stress…there's no way I could fit and fill in the rest of this tender and there's nobody else who can fill in the tender. It has just completely knocked us"

This was not a matter of poor planning, but of prioritising core survival tasks over future possibilities. A vivid picture of entrepreneurial burden can be seen here as the decision-making, crisis, and emotional regulation fall at the same time, thus putting constraints on resource coordination. This phase associates and suggest that crisis within SMEs is not a single

event, but a cumulative and compounding series of shocks, where adaptive responses were non-linear or tactical, and fragmented, but grounded in real-time logic of preservation and improvisation.

Phase three- Route Map Implementation (June 2020-September 2020)

Sense-Making Collapse, Bricolage Limitations, and Resilience Fatigue

While the Scottish Government moved toward a phased reopening in mid-2020, the HGE-1 remained in a holding pattern, unable to advance strategic decisions or recover operations meaningfully. This phase was marked by cognitive overload, emotional depletion, and stalled action. The Scottish Government's route map implementation created complex sense-making challenges as formal reopening contradicted market reality:

"Nothing new at all, which regards us in terms of the business. Nothing has changed at all. We are still only operating with two people and, I guess, we are just waiting to see what happened with the construction industry"

This response reveals complex sense-making that distinguished between regulatory changes (route map implementation) and operational reality (continued constraints). The participant's observation that *"nothing has changed"* despite official reopening demonstrates sense-making that prioritised operational experience over regulatory announcements. The reference to *"waiting to see what happened with the construction industry"* shows sector-specific sense-making that recognised interconnected market dynamics affecting business ecosystem recovery. The highlights a point of moving away from active sense-making and adaptive experimentation to cognitive withdrawal, where such a state of stagnation frequently observed in prolonged crises. The enterprise’s monitoring of construction industry activity demonstrated complex cue extraction processes:

"The construction industry started to open up last week, last Monday. We were still really quiet to put it that way"

This illustrates Weick's (1995) concept of *extracted cues* such as focusing on specific environmental signals as indicators of broader conditions. The participant extracted construction industry activity as a key cue for market recovery prospects, demonstrating sense-making that understood ecosystem interdependencies. The phrase *"still really quiet"* reveals ongoing interpretation of market signals that contradicted official reopening, showing sense-making that suggest operational experience over regulatory potential opportunities. The continued market challenges stimulated prospective sense-making about fundamental business model changes:

"Yes, it is not great. But we have got quite a lot of direct debits every month for finance. It is starting to become quite challenging. I think we might need to pivot the business"

This statement demonstrates prospective sense-making that projected current trends into future scenarios requiring strategic adaptation, where the recognition that *"it is starting to become quite challenging"* shows temporal sense-making that tracked snowballing impact development over time. The consideration of business pivoting shows sense-making that encouraged new strategic possibilities when existing frameworks proved inadequate. Because of the ER-1's idea of pivoting the enterprise in a hope of potential opportunities, they decided to start with market research, that highlights the understanding of sense-making requirements:

"I know that Scottish Enterprise used to provide a market research service and I have used it…Market research is really difficult to do and the Scottish Enterprise service is really good…I was asking them to do market research"

This demonstrates understanding of what information and processes were needed to support effective sense-making. The recognition that *"market research is really difficult to do"* reveals awareness of sense-making complexity that required external support for comprehensive environmental understanding. Operationally, the HGE-1 had resumed some projects, but not to pre-Covid levels. Even where activities restarted, uncertainty dominated, as this phase captures the loss of temporal security or grounding - a key breakdown in entrepreneurial sense-making. With no clear short-term goals and no dependable long-term horizon, the HGE-1 appeared in what could be described as strategic fog.

This illustrates *a crisis-induced strategic paralysis*, where it is not indecision from lack of ideas, but rather the infeasibility of any idea given the surrounding volatility. This phase has further highlighted that crisis management is not linear, and that SMEs that showed adaptive behaviour in early phases can encounter strategic exhaustion. Decision-making slowed, bricolage began to thin away, and resilience became a matter of endurance rather than creativity.

Phase four- Stabilisation Period (September 2020 - January 2021)

Continued Phase three and Complex Crisis Management

September 2020 represented a complex period where the HGE-1 faced complex and mixed crisis conditions - ongoing COVID-19 impacts combined with a severe theft incident that threatened business viability. This phase revealed the capacity to manage multiple, simultaneous crisis events while maintaining strategic development initiatives. The previously mentioned theft incident created *a crisis-within-crisis dynamic* that significantly increased management complexity, where the detailed description of equipment loss represents attempts to construct understanding of devastating operational impact, using concrete details to anchor sense-making in tangible realities. This incident encouraged ER-1 discuss enterprise's history thus engaging in retrospective sense-making about enterprise's development and some vulnerabilities:

"I do not know if this makes sense when I explain it, but our business was built up because my dad started it. And first, he was working in a van so he would buy one set of the equipment and then pay off and then get the next set"

This demonstrates in-depth retrospective sense-making that traced their development patterns to understand current vulnerabilities. The participant's uncertainty about explanation *"I do not know if this makes sense"* reveals the challenging nature of retrospective sense-making about complex evolution, where the detailed analysis of historical business model development shows sense-making that sought to understand how growth patterns created different risk profiles and operational requirements. The crisis enabled comparative sense-making between different operational approaches:

"When you are working in the van, it means that you are not having to take somebody on to do that job. Whereas the business does not work if I have a hundred eighty thousand pounds worth of kept on hire purchase and myself not working in the van"

This illustrates an attempt to compare different business model approaches, revealing how scale and complexity created different vulnerability patterns. The combine crisis forced integration of emotional and rational sense-making processes:

"I might be able to run by one van. So that means making three people redundant and just having a team of two. I just do not want to speculate I think I go from being optimistic which I am to be sitting on the floor in floods of tears"

This statement uncovers the emotional dimensions of sense-making during extreme crisis, where the participant's acknowledgment of emotional volatility *"from being optimistic... to... floods of tears"* demonstrates recognition of how emotional states affected sense-making

capacity and strategic evaluation. The reluctance to speculate shows desire to avoid potentially overwhelming scenario situation when emotional resources were depleted.

Later during this fourth phase, the ER-1 finally received positive answer from the insurance company, where the insurance resolution provided crucial sense-making support and final relive:

"So we feel very lucky that the insurance company turned and said that because the other businesses had been broken into, it was proof that we would have been broken into as well…So luckily the other businesses were broken into and that is what saved us essentially. So, it was good to know, we barely got two new sets of cameras and they are better than the cameras that we had before"

This outcome reveals how external factors (other businesses being targeted) combined with formal risk management mechanisms (insurance) to enable recovery. The participant's observation that *"other businesses were broken into and that is what saved us"* demonstrates the complex, sometimes paradoxical nature of crisis resolution. The recognition that replacement equipment *was "better than the cameras that we had before"* suggests potential for crisis-driven improvement, thus gaining enhanced capabilities through forced replacement. This demonstrates how external validation enabled sense-making resolution of previously impossible interpretive challenges. The insurance company's reasoning provided a plausible narrative, enabling psychological and practical recovery. At the same time, the recovery experience generated new interpretive frames about crisis and opportunity and potential benefits from crisis exposure:

"I am kind of hoping we can come back like stronger because of it"

This statement demonstrates the development of antifragile thinking, as the recognition that crisis exposure could generate strength rather than merely restore previous capabilities. This

represents an important psychological and strategic shift from crisis survival to crisis-enabled growth. Despite compound crisis conditions, the HGE-1 maintained coherent sense-making across multiple strategic initiatives:

"I have almost got the GPR report ready to send... I am also putting in an application for the Pathfinder program... there is also some funding from digital development funding. So I have taken some quotes for some companies for some digital marketing"

This demonstrates sense-making capacity that managed multiple strategic narratives simultaneously. The ability to maintain coherent understanding across diverse development projects shows cognitive ability to compartmentalised, while integrating different strategic initiatives. The approach to capability development highlighted experiential over analytical sense-making:

"So that was something I have seen they have run it for a few years now, but I guess just because we are going to be doing a new product. I think it would be quite good to do a program that sort of makes you have some action essentially"

This reveals preference for action-oriented sense-making that generated understanding through doing rather than extensive pre-analysis. The phrase *"makes you have some action essentially"* emphasises sense-making approaches that selected experimental learning over comprehensive planning.

Phase five- Second Lockdown (January 2021 - March 2021)

Enhanced Sense-Making Competence

The second lockdown tested accumulated sense-making learning and revealed enhanced interpretive capabilities:

"So obviously the second time I'm more prepared for it. But that is more, I think the government was more prepared for as well, the system was a lot easier"

This statement demonstrates sense-making competence development, with the enhanced ability to process and interpret crisis conditions based on accumulated experience. The participant's recognition of both personal and governmental learning shows advanced understanding of collective sense-making improvement. The observation that *"the system was a lot easier"* shows sense-making about sense-making support systems, understanding how improved information flows and procedural clarity enhanced interpretive capacity. The HGE-1's response demonstrated successful integration of crisis conditions into normal operational frameworks:

"Yeah, this time around it is not really a pause, compared to what happened last summer"

This shows sense-making evolution that normalised in a way previously exceptional conditions. The characterisation of lockdown as *"not really a pause"* demonstrates interpretive framework development that integrated crisis conditions into ongoing operational understanding rather than treating them as temporary disruptions. The extended crisis period caused fundamental sense-making reorientation toward value-based strategic interpretation:

"I am going to take the business in a different direction... But that also gives me the chance to maybe take the business into direction, which I had liked more of myself because I am not perhaps a waste disposal interested person as that was not really my passion"

This reveals profound sense-making transformation that moved beyond operational adaptation to fundamental reconsideration of enterprise's purpose and personal meaning. The recognition that waste disposal *"was not really my passion"* demonstrates crisis-induced

self-awareness that enabled more authentic strategic sense-making. The phrase *"take the business into direction, which I had liked more of myself"* shows sense-making reorientation that integrated personal values and interests with strategic interpretation, moving beyond purely market-driven meaning construction. The ER-A1 also shared some ideas about strategic reorientation:

"I was just doing what I thought was generate the most amount of income, but I think it is about doing and trying to get the business thing that I enjoy more, even if it does not make that much money"

This displays evolution from profit-maximising sense-making to value-integrated interpretation that balanced multiple dimensions. The willingness to accept potentially lower financial returns shows sense-making maturation that prioritised authentic purpose alignment over single-metric optimisation. The development of water foot printing capabilities demonstrated innovation in sense-making:

"We use a lot of water in what we do, but I've got no idea how much water we use and so I'm thinking about seeing if I can come up with a software and it would be software at combined with data loggers"

This shows creative sense-making that constructed innovation opportunities through internal operational analysis, with the recognition of knowledge gaps *"I've got no idea how much water we use"* prompted sense-making about measurement and monitoring possibilities that could create new service offerings. The HGE-1's approach to market opportunity identification demonstrated sophisticated systems-level sense-making:

"I'm hoping that potentially, it might grow some arms and legs because although we do a lot of carbon tracking at the moment, but nobody really tracks our water consumption and I'm hoping there might be a bit of leverage in it"

This illustrates enactive sense-making, where there is an understanding that enterprise's actions could help create new market categories rather than simply responding to existing opportunities. The phrase *"might grow some arms and legs"* shows speculative sense-making that constructed possibility through imaginative projection. The strategic reorientation highlighted HGE-1's development over financial metrics:

"So, it's not going to grow the company in a financial way, but I'm hoping it will grow it in a people way as we can start employing more intelligent people"

This demonstrates sense-making about organisational value creation that extended beyond financial measures to encompass capability development and workforce quality. The desire to *"employ more intelligent people"* shows sense-making that constructed organisational development focused on human capital enhancement. It shows a shift in *entrepreneurial identity*, that is usually associated with a post-crisis phase, but in this case, with still in crisis period. The crisis was not only an economic shock, but it also reshaped how the HGE-1 saw the purpose of this enterprise. This is where new frames emerge not just from tactics but from changes in belief about what success looks like. In one of the last longitudinal exchanges, the ER-1 stated:

"I am trying to pivot the business, but I don't know what it is. I don't know what into yet, but I'm hoping this little side project or will potentially give us some more ideas because I've examined all the ways of growing the business in the classic way that people would grew my type of business and that's just not what I want. So this is more in line with something to do with my values something which I might be a lot more interested in as opposed to the other

stuff. So, yeah, I'm basically trying to find any opportunities to pivot at the moment. So I'm going to do an internal exercise and see if that comes up with anything"

Although future-facing ambitions had been tempered, there were glimmers of innovation, as the ER-1 shared a preliminary idea to explore a small side offering that had emerged during the downtime and midst of this crisis. While the specifics or concrete ideas were formed yet, where was a clear experimentation under constraint - *the phenomenon of bricolage*, as planted seeds for a possible future model. The longitudinal findings about the first Potential High-Growth Enterprise (HGE-1), reveals evolution in sense-making capabilities across the five crisis phases.

Initial sense-making breakdown in phase one gave way to structured information processing in the second phase, followed by a strategic environmental scanning in phase three, and compound crisis integration in phase four, with a mature crisis normalisation or acceptance in the last identified phase five, where this evolution demonstrates enterprise's learning that enhanced crisis management capabilities over time. Each phase built upon previous sense-making experiences, creating accumulated interpretive competence that enabled more sophisticated crisis navigation.

The crisis caused fundamental identity construction that evolved across phases. Initial identity disruption gave way to identity maintenance, then strategic identity exploration, compound crisis identity testing, and finally value-based identity reorientation. This evolution illustrates how crisis conditions can enable profound identity development that extends beyond operational adaptation to encompass fundamental reconsideration of enterprise's purpose and personal meaning. Their approach to environmental construction became increasingly advanced across phases, where early reactive sense-making evolved into proactive environmental scanning, strategic possibility construction, complex crisis management, and finally systems-level market construction.

This progression shows how sense-making capabilities can develop from passive interpretation to active environment creation through crisis learning and adaptive practice. From a sense-making perspective, these enterprise's structures are interpretive rather than objective constraints. The crisis revealed how structures (market relationships, operational

routines, strategic orientation) were sense-made entities that could be reconstructed through changed interpretive processes. The observed evolution from viewing structures as constraining (initial crisis phase) to seeing them as flexible (later phases) demonstrates how sense-making processes can be transformed through interpretive re-development.

In conclusion, this first case of *Potential High-Growth Enterprise (HGE-1)* demonstrates the complex, multi-layered nature of SME crisis response across five distinct temporal phases of pandemic management. The longitudinal analysis of this case reveals in great level of details, almost to a month and showcased how the enterprise developed an increasingly mature crisis management capabilities through accumulated learning and adaptive practice refinement. It further details and illustrates the dynamic relationship between crisis severity, organisational learning, and strategic transformation, showing how extreme events can encourage not just operational adaptation but fundamental organisational evolution toward more resilient and value-aligned business models. The identified theoretical integration across phases shows important insights about the practical application of sense-making, effectuation, bricolage, and resource-based approaches in extended crisis contexts, while highlighting the temporal dimension of crisis management that enables organisational learning and capability development over time, which will be further explored in the analysis and discussion chapter.

Characteristics	Key Events & HG1 Enterprises' Responses	Theoretical and Organisational Insights
	Phase 1: Trigger Event	
Initial Shock and Disorientation	WHO pandemic declaration • UK first lockdown • All orders cancelled • Staff sent home • "Absolute nightmare" period	Sense-making crisis • Breakdown of interpretive frameworks • Identity construction collapse • Cognitive overload
Early Adaptations	Classified as essential business • Minimal actual demand • Limited external support • Isolated decision-making	Extracted cues processing • Plausibility over accuracy • Social sense-making breakdown • Entrepreneurial isolation
Financial Position	Debt-free status provided relief • Growth plans suspended • Survival-focused mindset	Frugality as pre-existing advantage • Retrospective sense-making • Shift from goals-to-means thinking
	Phase 2: Reorientation and Crisis Layering	
Strategic Pivot	Reassessed business model feasibility • Cancelled heavy equipment investment • Explored "completely unrelated" opportunities • Considered smaller, flexible options	Effectuation principles (affordable loss) • Emergent strategy formation • Prospective sense-making • Strategic flexibility development
External Support	Government funding information • Furlough scheme details • Application-based support processes	Social sense-making restoration • Structured information flows • Identity maintenance through accountability • Bureaucratic vs. market mechanisms
Compound Crisis	Theft of all equipment • Insurance complications (keys on-site) • Potential business closure threat • Missed tender deadline due to stress	Crisis layering effects • Cumulative shock impact • Resource coordination constraints • Cognitive overload consequences

Phase 3: Route Map Implementation		
Operational Stagnation	Continued two-person operation • Minimal change despite reopening • Dependency on construction industry recovery • Market remained "really quiet"	Regulatory vs. operational reality gap • Sector-specific sense-making • Environmental cue extraction • Operational experience prioritisation
Strategic Challenges	Increasing financial pressure • Direct debit obligations mounting • Pivot necessity recognition • Market research requirements	Temporal sense-making development • Strategic adaptation pressure • External support dependency • Sense-making complexity awareness
Decision Paralysis	Strategic fog conditions • "Waiting as strategy" • Resilience fatigue • Reduced creative bricolage	Crisis-induced strategic paralysis • Non-linear crisis management • Adaptive behaviour exhaustion • Defensive positioning
Phase 4: Stabilisation Period		
Complex Crisis Management	Simultaneous COVID-19 and theft impacts • Historical business model analysis • Workforce reduction considerations • Emotional volatility management	Crisis-within-crisis dynamics • Retrospective sense-making depth • Emotional-rational integration • Vulnerability pattern recognition
Insurance Resolution	Positive insurance outcome • Equipment replacement with upgrades "two new sets of cameras" • Relief and recovery opportunity	External validation importance • Paradoxical crisis resolution • Crisis-driven improvement potential
Strategic Development	GPR report preparation • Pathfinder program application • Digital marketing funding pursuit • Action-oriented learning preference	Multiple strategic narrative management • Cognitive compartmentalisation • Experiential over analytical approach • Experimental learning emphasis

Phase 5: Second Lockdown		
Enhanced Competence	Better prepared for second lockdown • Improved government systems • Crisis normalisation • Operational integration	Sense-making competence development • Collective learning recognition • Crisis condition normalisation • Framework evolution
Strategic Reorientation	Value-based direction change • Personal passion alignment • Reduced income acceptance • Authentic purpose prioritisation	Fundamental sense-making transformation • Value-integrated interpretation • Identity-strategy alignment • Post-crisis identity development
Innovation Development	Water foot printing software concept • Internal operational analysis • Systems-level market construction • "Intelligent people" employment focus	Creative sense-making application • Innovation through constraint • Enactive sense-making • Human capital emphasis

Table 5.0 - Summary table of the HGE-1 case study that captures the key information across all five phases, Author 2024

Case two: Potential High-Growth Enterprise two (HGE-2)

A Potential High-Growth Enterprise two is a Scottish distillery, operating within a complex multi-sector ecosystem encompassing alcohol production, rural tourism, e-commerce, and desire to engage with international trade. This small enterprise (employ less than 49 people) was founded in 2013 and operates predominantly in the food and drinks sector. Their primary activities include a gin production distillery, an on-site tourist shop, distillery tours and tastings sessions and online sales. This enterprise (*HGE-2*) has a deliberately constructed revenue diversification across multiple market channels such as on-site tourism experiences, retail shop operations, direct-to-consumer e-commerce, supermarket distribution networks, export markets, and hospitality sector sales. This strategy was not just operational diversification but represented a complex approach to environmental scanning and risk distribution that proved crucial for crisis navigation. The food and drinks industry was significantly influenced by the Covid-19 crisis and its associated restriction measures, where the enterprise's location in rural Scotland created both vulnerabilities due to tourism dependency and geographical isolation and advantages such as authentic heritage positioning and ability to access government support, that shaped sense-making processes throughout the crisis period. The pre-existing relationship with government support systems provided established communication channels that became critical during crisis information processing and resource access.

Phase one - Trigger event (March 2020)

Cognitive Disruption and Analytical Sense-Making Integration

The WHO pandemic declaration and UK's first lockdown created what Weick (1995) identifies as a fundamental sense-making crisis, yet HGE-2's response demonstrated integration of emotional processing with analytical assessment. The participant ER-2 quick quantification of impact reveals cognitive capabilities in attempt to comprehend the initial crisis influence:

"Ninety percent of our sales has stopped, so we have lost ninety percent of sales. Obviously, shop is shut, so, we have lost our tourist. There are no tourists here, no sales to tourists, which was a big part of our business, a big core of our business. Quite worried"

This statement shows sense-making competences developing under stress, where the HGE-2 attempted to maintain quantitative assessment capabilities while processing severe emotional and operational shock. The precision of *"ninety percent"* indicates cognitive processing that moved beyond initial disorientation to structured analysis, revealing sense-making capabilities that integrated emotional acknowledgment *"quite worried"* with operational evaluation. This represents a form of "extracted cues", whereby focusing on specific quantifiable signals to try and interpret situation during overwhelming uncertainty. The temporal reference to tourism as *"a big part of our business, a big core of our business"* demonstrates retrospective attempt to evaluate and make sense of pre-crisis revenue to understand current vulnerability. This retrospective analysis provided foundation for subsequent strategic adaptation by identifying which revenue streams remained viable during crisis conditions.

The crisis forced abrupt organisational identity reconstruction as the enterprise shifted from multi-person operations to single-person management due to previously mentioned cancellation of all the essential operations:

"We put out staff; we furloughed all our staff. I am the only one working now"

The transition from collaborative organisational identity to isolated individual operation represents more than operational adjustment. It essentially establishes identity reconstruction that affects all subsequent sense-making processes, where the phrase *"I am the only one working now"* indicates not just workforce reduction but transformation of organisational structure and decision-making processes. At the same time, the transition to single-person operation may reflect not mature crisis management practices but rather the precarious nature of small business, where the employment relationships and financial

capabilities are limited. This participant ER-2's decision may be viewed as strategic decision-making or precaution in the midst of unknown crisis and may represent reasoning of structurally determined outcomes rather than evidence of sense-making capabilities.

Despite experiencing severe operational disruption, the HGE-2 exhibited enactive sense-making by constructing opportunity within crisis constraints:

"I guess, the only plus that it says is that the website sells and their sales in Amazon have gone really well"

This statement suggests enactment by creating sensible environments through interpretive action rather than responding to predetermined conditions. More specifically, enactment is the process through which people actively shape their environment through their actions and then make sense of what they have created, because it is not just that individuals react to the environment, they co-create it through how they act and the meanings they assign to events. This is where the ER-2's ability to show and share positive signals *"gone really well"* from an overwhelmingly negative environment demonstrates sense-making that realistic assessment with strategic hopefulness. The phrase *"the only plus"* shows cognitive processing that actively searched for positive elements within crisis conditions, enabling continued strategic thinking. This sense-making angle represents what could be characterised as *"opportunity construction within constraint"*, the ability to identify and elaborate on positive environmental signals that enable strategic action despite severe negative conditions. The recognition that digital channels were thriving while physical operations shut down demonstrates environmental scanning that distinguished between different market dynamics rather than treating crisis as negative.

Given the crisis spread and its severe impact on health with the overall lack of sanitising products availability, the HGE-2 had the equipment at the distillery that they could convert into hands sanitisers production. Which is what they have done, but they did not want to profit of it and take advantage of the overall crisis uncertain state. Their approach to potential crisis opportunities showed integration of ethical considerations with business opportunity

assessment. Given that this enterprise highly entrepreneurial, when the ER-2 was asked about any opportunities that were brought on by a crisis, their response was:

"Yes, there is a couple of our own, like the hand sanitiser side of things. But we decided to avoid that, we decided not to do it because we did not want to be seen to be profiting from these circumstances. We made the sanitiser free of charge for NHS and it is in our local area"

This response demonstrates the ability to integrate value-based considerations with opportunity evaluation during resource-constrained crisis conditions. The decision to provide sanitiser free rather than commercialise, represents sense-making that balanced immediate financial pressure with long-term reputational and community relationship considerations. The phrase *"we did not want to be seen to be profiting from these circumstances"* showcases sense-making that extended beyond immediate operational concerns and take into consideration stakeholder perceptions and community relationships. This demonstrates understanding of how crisis actions shape future organisational identity and stakeholder relationships, showing sense-making that connected present decisions with future consequences. Furthermore, the choice to serve NHS and local community demonstrates enactive sense-making that constructed the organisation's role as community contributor rather than profit acquiring business. This value-based enactment shaped subsequent identity construction and stakeholder relationships throughout the crisis period.

This initial stage or phase of the crisis development inevitably forced the HGE-2 revisit their strategic structure and engage in the survival sense-making mode. As a result, the crisis triggered immediate strategic reorientation that demonstrated resource focusing under extreme constraint, where the ER-2 shared:

"Yes, we are at survival mode at the moment, to be honest... we implemented a survival strategy, so we focus on digital marketing for our website and also advertising on Amazon because there are two sales channels that we can focus on, and also on supermarkets that we work with. So, we focus on that. It seems to be doing well for us, but we have also done

things like, we protect the business with slacked all of our costs. Things that we plan and project, we just cut them all, stop them all"

This extract from the initial crisis phase discussion in March 2020 showcases a very clear, but yet cautious SMEs' response, where this response demonstrates resource-focused strategic approach to sense-making, as the HGE-2 shows the ability to rapidly identify available means and concentrate efforts accordingly. The acknowledgment of *"survival mode"* shows honest assessment of crisis severity, avoiding denial and attempting to maintain strategic focus. This represents attempt to crisis sense-making that balances realistic threat assessment with actionable strategic focus.

The focus on specific channels demonstrates what appears to be strategic resource reorientation or attention, where the ER-2 mentions "*advertising on Amazon"* and "*supermarkets that we work with*", that can be interpreted through a lens of *effectuation theory* or *logic* (Sarasvathy, 2001), suggesting means-driven action that works with available resources such as existing digital capabilities or established supermarket relationships. The identification of digital channels as viable focus areas exhibits enactive sense-making that made strategic possibility within severe operational constraints. Rather than becoming paralysed by overall crisis severity, they engaged in means-driven adaptation that leveraged available capabilities, demonstrating again *effectuation logic* emerging from crisis-induced sense-making processes.

However, critical analysis must consider whether this represents genuine strategic choice or simply the only viable options remaining after tourism and hospitality channel collapse. Following the same logic, *resource-based analysis* might interpret this as leveraging existing capabilities, which could reflect path dependency where previous investment decisions again such as website development, Amazon presence or supermarket relationships determined available crisis responses rather than in crisis strategic thinking.

The phrase *"protect the business"* frames cost cutting as defensive strategy, but the abrupt or harsh approach *"cut them all, stop them all"* suggests retrenchment that may reflect panic-driven decision-making rather than strategic cost optimisation. This may indicate cognitive overload that SMEs experience and go through as they are trying to operate or make decisions

in the midst of severe crisis. Such overload can potentially impact the ability to make these important decisions, due to amount of stress and uncertainty rather than analytical assessment of individual cost-benefit relationships.

Phase two- Reorientation and Crisis Layering (April 2020 - June 2020)

Sense-Making and Structured Information Processing

For the HGE-2 this phase was strongly associated with the information revision provided by various sources such as Government support systems, Chambers of Commerce and various industry associated groups. The ER-2 saw a great value in obtaining such information as it was a direct contributor to their ability to evaluate received information and start formulating strategies on how to pivot enterprise, in their overall sense-making ability and environmental scanning in better crisis navigation. In one of the first conversations that took place in the second phase, the ER-2 shared:

"We are struggling to keep staffs [due to covid restrictions] *and trying to change our business model to be able to stay in business. We were lucky that we had a good quarter one, our business is in a good position but we still have to think how we are going to maintain progress. So, I spend a lot time looking at figures, it has been a good thought to check how other businesses doing"*

Here, the ER-2 shares struggles caused by the Covid-19 restriction and external regulatory requirements, thus realising magnitude of the overall impact. It can be seen, that the HGE-2 faced a clear operational challenge where the associated restrictions created staffing limitations that required adaptive management responses. During this time, the enterprise was still in the process of trying to understand on how to process, this continuous sense-making process and attempted environmental adaptation where they had to modify the workforce approach based on health and safety requirements beyond their control. The

acknowledgment of *"struggling"* indicates honest assessment of operational difficulties while the specific attribution to Covid restrictions shows analytical thinking that correctly identified external causation.

Furthermore, the approach to business model adaptation reveals strategic flexibility during crisis, as it was mentioned *"trying to change our business model to stay in business"*, where this demonstrates strategic agility, as the HGE-2 recognised that existing business approaches might not be sufficient for survival in changed market conditions. Rather than trying and maintaining pre-crisis operational models, they engaged in the process of sense-making and commitment to reconsider how it creates and delivers value. This represents adaptive strategic thinking that remained flexible about means while maintaining clarity about essential objectives of staying in business.

The HGE-2 evaluation of its position demonstrates temporal analysis, where it was mentioned *"lucky that we had a good quarter one",* thus highlighting important analytical capabilities. It suggests understanding that past performance might not predict future results during crisis conditions, as despite being in a *"good position"*, still, there is a need to *"think how we are going to maintain progress"*, demonstrating forward-looking strategic approach. This shows understanding that even relatively strong positions require active management during crisis periods.

Additionally, the Scottish Government's business relief announcements and extended lockdown period created new opportunities for sense-making and renewal in the strategic thinking through information flows:

"*We have also been receiving news and rules updates on a weekly basis from..* [account manager]. *So, it has been really useful that due to popularity and there is not a criticism of prices but what tends to happen is when the government releases that information, we get it from the chambers of commerce, we get it from the Local and Tourism group and also we get if from HIE. They have been really good*"

This response shows understanding of information ecosystem dynamics and the importance of multiple information sources for comprehensive sense-making. The weekly communication pattern established interpretive routines, that provided cognitive formation during uncertainty. The recognition of multiple information channels such as chambers of commerce, tourism groups and government support organisations demonstrate understanding of how different sources provide varied perspectives that enable more comprehensive environmental understanding. The phrase *"they have been really good"* indicates evaluation of information quality and relevance, showing sense-making that assessed not just information content but information provider capability. This supports the ability to evaluate and interpret support quality, that might support future sene-making of the surrounding environment. The ER-2's analysis of information relevance and trustworthiness shows capabilities of information processing:

"Even it may not have to be completely relevant, we have looked at things and we trust in this information. There are a lot of things coming in in terms of information, because some of the funding to be specifically for England, some has been taken to Scotland government and so on. It is a lot easier for us to have the information… relevant for our type of business and our location"

This statement demonstrates information filtering and trust assessment that became crucial during information-intensive crisis periods. The recognition that information might not be *"completely relevant"* but still trustworthy shows understanding of how partial relevance can still provide interpretive value and consequential support in sense-making. Further, the awareness of information complexity (England vs. Scotland specific funding) demonstrates environmental scanning that understood regulatory complexity and geographical variation in support provision, that can be also quite difficult during the intense crisis phase.

This particular phase of the crisis development caused a great deal of disorientation for the HGE-2, as they were not sure what support would be useful and attempted to get everything 'just in case', due to the highest levels of uncertainty caused by this crisis:

"I was trying to get as many layers of protection for my business as possible, I want to have a loan approved even if I do not think I ever need it...The bank was asking for eighteen months' worth of forecast. I have no idea what to forecast for the next season"

This statement shows a risk management thinking that sought multiple protection layers while acknowledging forecasting challenges under extreme uncertainty, where the phrase *"I have no idea what to forecast"* demonstrates realistic sense-making that acknowledged uncertainty rather than constructing false precision, this showing understanding of how crisis conditions make traditional planning approaches inadequate.

Despite ongoing crisis conditions and moving along this second phase, the HGE-2 demonstrated evolution from reactive crisis management to proactive opportunity identification, where ER-2 shared some preliminary plans on how to move forward:

"I feel okay at the moment we are not under any stress…but I am now starting to look for opportunities to see where I can develop the business in this kind of unusual circumstances. So, that is what I am doing now and what I have done between the start of the impact of Covid-19, it is just to get the business in order… it has been defenceless on this kind of interim period…but we are looking for opportunities again"

This statement demonstrates temporal ability towards sense-making that moved beyond immediate crisis response to future-oriented opportunity interpretation. The phrase *"unusual circumstances"* reframes crisis conditions as opportunity context rather than purely constraining environment, showing enactive sense-making that constructed possibility within constraint. The evolution from *"not under any stress"* to *"looking for opportunities"* demonstrates sense-making progression from crisis stabilisation or acceptance of the new circumstances to strategic development. This represents clear strategic crisis management that maintained strategic development capacity while managing immediate challenges. This phase overall exhibits the HGE-2' s approach to comprehensive crisis management thinking

that addressed both immediate survival needs and longer-term strategic positioning through integrated adaptive responses.

Phase three- Route Map Implementation (June 2020-September 2020)

Operational Recovery and Integration of Sense-Making

The Scottish Government's phased reopening created complex sense-making challenges around balancing recovery opportunities with safety requirements and operational constraints for this particular enterprise. During this phase, the ER-2 shared the challenges associated with partial reopening but still, in a very challenging and restrictions affected environment:

"The production has opened. We have got people back in production but with spacing requirements for distancing. Production is back but on a constrained basis, we will open the shop on the 15th of July when hotels and museums can reopen"

This demonstrates operational sense-making that integrated regulatory requirements, safety considerations, and business recovery needs. The ability to resume production while managing spacing constraints shows practical problem-solving and the need to further understand on how to proceed with the enterprise reopening. The further mention of planning for shop reopening on the *"15th of July when hotels and museums can reopen"* show environmental scanning that understood broader industry recovery patterns and aligned organisational reopening with potential ecosystem recovery, as this represents understanding of how organisational recovery connects with broader market recovery patterns. The ER-2 further shared additional challenges that were identified in the process of planning to reopen:

“We need support to make additional storage and bottling areas. Because we have this constrained space with people here, that means our production capacity is really reduced. What I have asked her [allocated account manager] *to help us support fixing our bottling area, that will allow us to have more people in, but with the same space*"

This statement highlights sense-making in strategic capabilities, that identified how physical constraints created operational limitations and developed resource-based solutions. Rather than accepting reduced capacity as inevitable consequence of safety requirements, the HGE-2 engaged in creative problem-solving that sought to optimise space utilisation through strategic investment through the potentially available support systems. The phrase *"allow us to have more people in, but with the same space"* shows innovative thinking about space optimisation that addressed both safety requirements and production capacity needs. It can be said that this represents *bricolage thinking* (Baker & Nelson, 2005) that creatively recombined existing resources to address new constraints.

In the previous phase the HGE-2 shared their motivation to look for new opportunities and they were approaching it mainly through finding prospective fundings or grant opportunities that were being released during that time to support SMEs during the Covid-19 crisis. It was expected that they may experience rejections with grant and alternative support discovery. During one of the conversations, the ER-2 revealed struggles of resource acquisition complexity:

"Just recently, we applied for a pivotal grant in a Scottish enterprise. Our grant application was rejected, and then we appealed it, and it went to Highlands and Islands Enterprise. That is when they spoke to us and tried to understand our needs and what we needed the grant for. We did get rejected for the pivotal grant, but they said there were other supports available for businesses trying to transition their business and operations because of the impact of Covid"

This response demonstrates resilient capabilities and sense-making process that transformed rejection into alternative opportunity exploration. The ability to understand different support mechanisms and transition between different agencies shows attempted knowledge acquisition of resource ecosystem and navigation strategies. The recognition that rejection from one source led to alternative support discovery and consequential understanding how different support providers offer varied assistance and how rejection from one source can lead to alternative opportunities shows again ability to make sense of challenging and complex new environment created by the Covid-19 crisis. This represents understanding of resource access as exploratory process rather than single-path pursuit.

The new learning and formation of new cognitive links also took place during this phase, where their experience with support systems revealed renewed appreciation for collaborative approaches that generated alternatives rather than simple approval/rejection responses:

"They really try to understand what we are asking, and then, they do come up with alternative ideas or they give you something that they have picked up from another business or how they have changed a business…they suggest to try this or maybe reduce this to something else. Even when they say no, they try to give us other things to think about or a way forward"

This response demonstrates appreciation for consultative support approaches that provided creative problem-solving collaboration, with the recognition that support providers drew on experience with other businesses (while maintaining confidentiality) shows understanding of how knowledge transfer and best practice sharing enhance support quality. The value placed on alternative options *"try to give us other things to think about"* demonstrates appreciation for creative sense-making collaboration that expanded opportunities rather than merely processing predetermined requests. This represents recognition of how external relationships can enhance internal sense-making capabilities through collaborative thinking.

Once the HGE-2 was able to reopen, but still in quite constrained environment and they had to rethink their offerings. The ER-2 shared the following:

“We are not doing tourists, but we are going to be doing a tasting experience. The reason we are not doing tourists here is we are trying to keep tourists away from our production team, plus to clean the distillery every time afterwards. You can have your staff feel safe, it is good. It is good to see some life at the site, for the last six months, it has only been me with no tourists. So, it is good to see people back and also see customers back”

This shows operational adaptation that demonstrates creative problem-solving, safety prioritisation, and the psychological dimensions of crisis recovery. Their approach shows how businesses can maintain customer engagement while managing health risks through innovative service reconfiguration, as they developed version of tasting experiences as an alternative to full tourism demonstrates innovative adaptation to regulatory and safety constraint. This pivot in enterprise offering represents creative problem-solving that found middle-ground solutions between complete closure and reopening. Rather than viewing tourism restrictions as a restriction, they developed hybrid offerings that maintained customer connection while managing risk, showing entrepreneurial thinking that identified new service possibilities within constraint parameters.

The Covid-19 imposed restrictions, and the cleaning considerations show practical thinking about operational sustainability, where *"plus to clean the distillery every time afterwards” indicate* realistic assessment of additional resource requirements for full tourism operations, as they recognised that extensive cleaning protocols would create operational burdens that might not be sustainable given resource constraints and operational complexity. Where *"you can have your staff feel safe, it is good"* shows recognition that employee confidence and psychological comfort were crucial for operational effectiveness.

The above quote also captures the profound isolation experienced during this particular crisis and the psychological relief of renewed human interaction, as the ER-2 mentioned *"some life at the site"* indicates how deeply the absence of visitors affected the overall atmosphere and

personal experience. They further mention that the six-month isolation period *"it has only been me"* reveals the personal cost of crisis management brought on by this particular crisis, especially for SMEs, who experienced both professional and social isolation simultaneously. This shows how crisis impact extends beyond operational and financial dimensions to include significant personal and psychological effects.

Phase four- Stabilisation Period (September 2020 - January 2021)

Operational Innovation and Strategic Development

For HGE-2, this phase demonstrates the transition from crisis adaptation toward proactive strategic planning and resource development. During the initial months of this forth phase, the ER-2 was proactively seeking for tangible financial resources to start expanding the floor space (this previously mention in phase three). They first reached out to the allocated by HIE account manager to seek such contribution and probe for available opportunities:

"Last month, I just reached out to get an update on the project and the account manager replied really quickly to say that they would support the project and then identified things I needed to do to really formalise the support"

This demonstrates proactive communication and systematic approach to resource development, as HGE-2 took initiative to provide updates and secure support, showing strategic thinking that maintained momentum on development projects despite ongoing crisis conditions. The quick positive response and clear guidance about formalisation requirements suggests effective relationship management and understanding of support processes. The move toward *"formalise support"* represents important transition from informal assistance to structured resource commitment, suggesting the enterprise's ability to adapt and navigate from crisis survival toward strategic development.

The focus on space expansion represents strategic thinking about operational optimisation and future capacity:

"They will support that to expand and also to give us additional space; [the funding arrangement] *was around thirty-five to sixty percent"*

This expansion focus demonstrates forward-looking strategic thinking that anticipated recovery and growth beyond immediate crisis conditions, because rather than maintaining minimal operations, the HGE-2 was attempting to position for enhanced capacity that could support increased activity levels. This partial funding structure shows realistic expectations about support relationships and willingness to co-invest in strategic development, especially given challenging crisis conditions, when various resources especially financial are very limited and constrained. This represents enterprise's ability to understand the challenges associated with funding obtainment during the crisis, demonstrating mature approach to resource development partnerships. The specific percentage range suggests negotiation took place and clear understanding of financial commitments, indicating project planning and resource management. Additionally, their approach to project development shows planning capabilities, as they understood the challenges associated with resources acquisition during the crisis:

"I just got to do a project proposal. I gave them budget figures, but they are asking for more details. I just have to gather more detail on that to be able to get the formalised approval"

This demonstrates understanding of formal planning requirements and willingness to engage in detailed project development processes, as they recognised that strategic investment required comprehensive planning and documentation, showing appreciation for systematic approach to resource allocation.

Despite HGE-2 ability to continuously engage in the sense-making around business development and pivoting in the crisis conditions, still, the reality of operating in such conditions was impacting the enterprise:

"It has been quiet these months. It is strange because of COVID, lots of other things to be thinking over. We had a really busy September [with operational aspects of reopening the business in the Covid-19 constrained environment] *but I may need to deal with tourists coming in"*

The ER-2's reflection on the broader context reveals important perspective on crisis conditions, indicating crisis normalisation where Covid conditions had become part of normal operating context rather than exceptional circumstances requiring constant attention. The characterisation as *"strange"* suggests psychological adaptation to unusual conditions that had become routine. Furthermore, the reference to "*lots of other things to be thinking over*" indicates cognitive capacity from pure crisis management to consider broader strategic and operational issues, suggesting adaptation to crisis conditions. Where ER-2 talks about "*I may need to deal with tourists coming in*" is a sign of a shift from crisis-period customer scarcity to managing initial renewed customers activity and be a mark that represents recovery in progress.

The overall approach during this phase demonstrates HGE-2 attempts to restore its' strategic confidence and development momentum, where they were simultaneously managing increased customer activity, developing expansion projects, engaging in formal planning processes, and preparing for seasonal business cycles. This multi-dimensional activity indicates cognitive and operational capacity that extended well beyond crisis survival toward comprehensive strategic development.

Phase five- Second Lockdown (January 2021 - March 2021)

Enhanced Sense-Making Competence and Learning Integration

The second lockdown revealed significantly enhanced crisis management capabilities that integrated learning from first crisis experience:

"We did not need any help, because in the first lockdown all was really unknown, you just have this fear that doors will be shut on you, not sell another bottle. But what happened was everybody just change their buying habits, people started to buy online"

This statement demonstrates more prominent crisis competence that integrated experiential learning with strategic confidence. The phrase *"all was really unknown"* shows how first crisis experience provided interpretive capabilities and frameworks that reduced uncertainty during second crisis. The recognition that *"everybody just change their buying habits"* demonstrates understanding of how consumer behaviour adaptation created opportunity rather than purely constraint. The evolution from *"fear that doors will be going to shut"* to confidence about trading shows strategic development that changed crisis perception from existential threat to manageable challenge. This represents clear crisis sense-making that integrated emotional processing with strategic learning.

This particular enterprise showed remarkable sense-making in ability to anticipate and implement proactive risk management practices, given the uncertainty surrounding this crisis's path of development. The HGE-2 preparation for second lockdown revealed anticipatory sense-making capabilities that enabled proactive rather than reactive crisis management:

"The other thing was we kind of suspect that it will be going to happen. We thought maybe in December or November, so we squirreled money away and prepared that. Because we kind of had a feeling there was going to be a second lockdown, we just changed the financial product, kind of squirreled away money for"

This response demonstrates advanced environmental scanning that used available information to anticipate likely scenarios and prepare accordingly, as the phrase *"kind of had a feeling"* indicates intuitive capabilities in sense-making that combined available signals with experiential knowledge to predict future conditions. The proactive financial preparation

"squirreled money away" shows ability to adapt and improved risk management that transformed sense-making into concrete action to prepare to potential threats brought on by this crisis. This represents HGE-2's growth from reactive crisis management to proactive crisis preparation based on accumulated learning and environmental awareness.

Furthermore, ER-2 shared the 'usual' challenges of trading in the winter months, where analysis of seasonal patterns showed understanding of how existing business characteristics provided unexpected crisis advantages:

"We are normally quiet in January, February, March, because of the nature of alcohol consumption in the UK. So, we are kind of prepared for semi-lockdown anyway, we normally do not lock the business time, but we could not until almost a slower pace business model for three months. We were ready for it, we find there is a way to trade with a website, with Amazon, and with supermarkets. We have the confidence that lockdown two would not be that bad, however long it was or whatever involved is. As long as we can check products and as long as supermarkets are being opened, then we will be fine"

This statement shows strategic ability and sense-making that recognised how pre-existing business patterns created natural resilience for crisis conditions. The recognition that seasonal patterns aligned with lockdown timing shows how business model characteristics can provide unexpected advantages during external disruption. The phrase *"prepared for semi-lockdown anyway"* demonstrates understanding of how their capabilities developed for normal operations can provide crisis management advantages. This represents strategic analysis that identified hidden resilience capabilities within existing business structure. Additionally, this shows operational capabilities that distinguished between complete closure and pace adjustment, indicating understanding of how business operations could be scaled and restricted rather than simply stopped.

The three-month timeframe indicates realistic temporal planning that integrated seasonal patterns with lockdown expectations, showing strategic thinking that considered multiple time-related factors in operational planning. Where the ER-2 states that "*we were ready for it*", demonstrates how first lockdown experience provided *proof-of-concept* for alternative trading methods that reduced dependence on traditional channels. The phrase *"we find there*

is a way to trade" indicates learning and discovery that identified viable operational approaches within constraint conditions, where the mention of specific channels (website, Amazon, supermarkets) shows understanding of revenue diversification that provided multiple pathways for market access during restrictions, thus reducing single-channel dependency.

The crisis experience provided a strong validation of the enterprise's pre-existing diversification strategy, where the ER-2 shared that:

"What I did learn is that we did a very very good choice, a few years ago, which was we wanted to have diverse revenue streams. So, we had a website, supermarkets, export, pub, restaurants, and independent shops. That really was to our benefit through that selling"

This response demonstrates sense-making that validated strategic decisions and reinforced diversification principles, that the ER-2 mentioned numerous times before that. Where again, the detailed breakdown of different revenue streams shows systematic analysis of how different channels provided varied resilience during crisis conditions. The phrase *"very very good choice"* indicates strong validation that reinforced strategic principles for future direction, thus representing strategic learning from crisis experience.

Thinking about the crisis, the HGE-2 also shared their approach in resource adaptability, where their support adaptation showed flexible resource management and strategic adaptation capabilities:

"It was great to know that they are [HIE] *willing to support us with any changes that we have to make that were forced because of Covid...So we had a marketing budget for trips overseas, we could use that money to and strengthen our position in the online marketplaces in different territories"*

This statement shows resource utilisation that converted travel marketing budgets into digital market development through a selective resource reallocation, where the ability to repurpose resources for different strategic objectives shows flexible thinking for resource utilisation under changed circumstances. During this time, the HGE-2 also shared their long-term plan to diversify into the whiskey production. This is a long-term plan, where the enterprise needs a great deal of external support in a form of funding. During this phase, and almost a year into 'Covid-19 crisis', they were able to revisit their pre-crisis plans, and even entering the second national lockdown in January 2021, still, despite ongoing crisis conditions, they were able to maintain long-term strategic development that shows sense-making in action:

"This project for whiskey diversification is the number one priority for the business. We had plans pre-Covid and then we were about to start them in February last year. And then we have kind of seen concerns about Covid on horizons, so we parked it, we were just really taken aback. Without the confidence of treating Covid and we know that we can continue"

Where they further shared their main concern with going ahead with this project a year ago and future planning:

"What we are worried about last year was if we spent money on new land and new equipment when the best business kept struggling for sales, we did not want to do that, so we parked it. But as it turned out, sales were strong enough and it gave us the confidence to then start the project. It was October last year. And it delayed things by six months because of Covid"

This demonstrates the enterprise's ability to sense-making that balanced immediate crisis management with long-term strategic development. The whiskey project represents thinking that extended far beyond crisis conditions to fundamental business development with decade-long timelines. Rather than abandoning strategic projects entirely during crisis, their preserved strategic vision while adjusting implementation timing due to the crisis impact,

thus representing strategic thinking that distinguished between core strategic direction (whiskey diversification) and tactical implementation timing.

Additionally, it was quite interesting to see the ER-2 discussion of the early recognition of Covid risks, thus showing environmental scanning capabilities that identified emerging risks before they became operational crises. The phrase *"seen concerns about Covid on horizons"* indicates forward-looking analysis that treated early warning signals rather than waiting for crisis impact to become obvious, where the decision to *"park"* the project demonstrates careful risk management that prioritised enterprise's stability over aggressive growth during uncertainty.

Throughout all of the identified five phase, the HGE-2 was attempting to pivot and find new resources to maintain positive business operations, where their approach to growth during ongoing crisis conditions showcased strategic adaptation that balanced development initiatives with survival necessities:

"We took time to use proof of opportunities to continue the survival mode. What I mean by that is we want to continue trying to get into new markets but realised it enables people offsetting sales with loss in the existing markets because of the impact of Covid on bars, restaurants, in general, sales"

This response demonstrates strategic sense-making that balanced growth initiatives with crisis realities through optimisation thinking, where the ability to pursue new market development while acknowledging existing market losses shows complex strategic thinking about resource allocation during partial recovery conditions. The phrase *"continue trying to get into new markets"* while managing existing market losses shows ability and understanding of how crisis conditions require rebalancing rather than simple growth or reduction decisions. It can be saif that this approach in attitude represents strategic thinking that optimised opportunity pursuit within crisis constraints carefully.

This particular enterprise and their path's evolution demonstrates learning that transformed crisis experience into enhanced interpretive capabilities, where each phase built upon

previous sense-making experiences while developing new cognitive and operational capabilities that enhanced future crisis management effectiveness. The pre-existing diversification strategy provided sense-making advantages, where the HGE-2 showed the ability to simultaneously process multiple environmental signals across diverse market contexts while maintaining coherent strategic direction. The diversification strategy functioned as both operational risk management and cognitive risk management by providing multiple interpretation sources that enhanced environmental understanding and reduced sense-making vulnerability to single market disruptions.

Overall, this second case demonstrates crisis management through diversified strategic planning and advanced sense-making capabilities that enabled not only survival but continued strategic development during extreme uncertainty. Their ability to maintain ethical decision-making while adapting operations, integrate anticipatory capabilities with reactive management, and leverage external relationships for interpretive enhancement provides crucial insights into resilient SME crisis management.

The longitudinal analysis reveals how pre-existing strategic positioning such as diversification can enhance crisis resilience not only through operational risk distribution but also through cognitive risk management that provides multiple environmental scanning sources and enhanced interpretive capabilities. The HGE-2's evolution from reactive crisis management to anticipatory crisis preparation demonstrates how crisis experience can develop enhanced capabilities that improve future crisis management effectiveness.

This case illustrates the interplay between strategic positioning, sense-making capabilities, and crisis management effectiveness, providing important insights for both theoretical development and practical crisis management in SME contexts. This enterprise's journey demonstrates how extreme events can cause not merely adaptation but fundamental capability enhancement that transforms crisis exposure from threat to opportunity for organisational development.

Characteristics	Key Events & HG2 Enterprises' Responses	Theoretical and Organisational Insights
Phase 1: Trigger Event		
Cognitive Disruption and Analytical Integration	WHO pandemic declaration and UK lockdown • Quantified "ninety percent of sales" loss • All staff furloughed except owner • "Quite worried" but maintained analytical assessment	Sense-making crisis • Cognitive disruption with analytical integration • Identity reconstruction from multi-person to single-person operation • Extracted cues processing under duress
Enactive Opportunity Construction	Website and Amazon sales "gone really well" • Only positive revenue stream during crisis • Identified remaining viable digital channels	Enactive sense-making • Opportunity construction within constraint • Environmental scanning that distinguished market dynamics • Plausibility over accuracy
Value-Based Crisis Response	Had capability to produce hand sanitiser but chose not to profit • Made sanitiser free for NHS and local community • Community contribution prioritised over profit	Value-based sense-making • Stakeholder perception consideration • Community identity construction • Social sense-making through community engagement
Survival Strategy and Resource Focus	Focused digital marketing on website and Amazon • Maintained supermarket relationships • Cut all planned projects and costs • "Survival mode" implementation	Effectuation logic • Means-driven action • Resource concentration under constraint • Bricolage with available capabilities • Affordable loss principles
Phase 2: Reorientation and Crisis Layering		

Structured Information Processing	Weekly updates from account manager • Multiple information sources (Chambers of Commerce, Tourism groups, HIE) • Filtered England vs Scotland specific information	Social sense-making restoration • Structured information flows • Information filtering and trust assessment • Multiple cue extraction capabilities
Strategic Flexibility Development	Struggled with staff retention due to restrictions • Attempted business model changes • Strong Q1 performance providing financial cushion	Strategic flexibility under crisis • Adaptive strategic thinking • Temporal analysis capabilities • Resource-based advantage utilisation
Multiple Protection Strategy	Applied for multiple funding sources "just in case" • Sought loan approval without immediate need • Struggled with 18-month forecasting requirements	Risk management thinking • Multiple protection layers strategy • Realistic uncertainty acknowledgement • Traditional planning inadequacy recognition
Evolution to Opportunity Identification	Moved from defensive crisis management to opportunity seeking • Looking for development opportunities in "unusual circumstances" • Achieved stress-free operational state	Temporal sense-making progression • Crisis reframing as opportunity context • Evolution from survival to strategic development • Prospective sense-making development
Phase 3: Route Map Implementation		
Operational Integration and Recovery	Production resumed with distancing requirements • Shop reopening planned for July 15th • Aligned with hotels and museums reopening schedule	Operational sense-making integration • Environmental scanning of industry recovery patterns • Regulatory requirement integration • Sector-specific sense-making

Constraint-Driven Innovation	Identified space constraints reducing production capacity • Sought support for additional storage and bottling areas • Creative space utilisation solutions	Strategic capability sense-making • Bricolage thinking (Baker & Nelson, 2005) • Creative resource recombination • Constraint-driven innovation processes
Support Ecosystem Navigation	Pivotal grant rejected by Scottish Enterprise • Successfully appealed to Highlands and Islands Enterprise • Discovered alternative support mechanisms	Resilient sense-making process • Resource ecosystem navigation • Rejection transformation into opportunity exploration • Support provider knowledge acquisition
Service Model Innovation	Developed tasting experiences instead of full tourism • Separated customer activities from production areas • Maintained customer engagement whilst managing risk	Creative problem-solving under constraint • Safety-conscious innovation • Entrepreneurial thinking within parameters • Hybrid service development approaches
Phase 4: Stabilisation Period		
Strategic Development Transition	Secured 35-60% funding support for expansion project • Engaged in formal project proposal development • Detailed budget and planning requirements	Strategic thinking beyond crisis conditions • Systematic approach to resource development • Partnership approach to resource acquisition • Formal planning capability development
Crisis Normalisation	Managed increased customer activity • Dealt with returning tourists • Adapted to "strange" new normal conditions	Crisis normalisation processes • Psychological adaptation to unusual conditions • Cognitive capacity expansion beyond crisis management • Recovery momentum management

Multi-Dimensional Strategic Activity	Maintained multiple development projects simultaneously • Prepared for seasonal business cycles • Enhanced capacity planning across functions	Multi-dimensional strategic capability • Comprehensive development approach • Temporal planning integration • Strategic development restoration
Phase 5: Second Lockdown		
Enhanced Sense-Making Competence	No external help needed • Understood changed buying habits • Confidence in online trading capabilities	Sense-making competence development • Crisis experience integration • Strategic confidence through experiential learning • Consumer behaviour adaptation recognition
Anticipatory Crisis Management	Suspected second lockdown coming • Financially prepared by "squirrelling money away" • Proactive risk management implementation	Advanced environmental scanning • Intuitive sense-making capabilities • Anticipatory sense-making development • Proactive versus reactive crisis preparation
Business Model Advantage Recognition	Recognised winter months naturally quieter • Aligned lockdown timing with seasonal patterns • Prepared for "semi-lockdown anyway"	Strategic analysis of business model characteristics • Hidden resilience capability identification • Temporal pattern recognition • Natural business advantage discovery
Strategic Validation and Development	Multiple revenue streams proved crucial • Website, supermarkets, export channels remained viable • Resumed whiskey diversification project • Repurposed marketing budgets for online development	Strategic decision validation • Revenue diversification effectiveness • Risk distribution success • Long-term vision maintenance • Resource reallocation flexibility • Strategic opportunity balancing

Table 5.1 -Summary table of the HGE-2 case study that captures the key information across all five phases, Author 2024

Case three: Potential High-Growth Enterprise three (HGE-3)

A Potential High-Growth Enterprise three is a technology consultancy operating in engineering design and product development with a particular expertise in wave energy, life sciences, and advanced manufacturing. The enterprise possesses sophisticated technical capabilities including laser cutting, 3D printing, CAD design, and rapid prototyping that proved crucial for crisis response capabilities. Their primary activities include consultancy engineering designs for industrial processes, production and research and experimental development on the natural sciences and engineering side of consultancy. The HGE-3 is small enterprise located in Highlands near Inverness, it employs less than 49 people and it was founded in 2014.

This case will present the findings of how the HGE-3 navigated the Covid-19 pandemic through rapid innovation, community contribution, and adaptive capabilities in sense-making processes. The enterprise three demonstrates crisis response through technological capability leveraging and demonstrates how pre-existing innovation resources can enable complex and rapid crisis adaptation and value creation. This enterprise is high growth due to their innovation driven approach in sense-making, as their innovation capabilities become the primary lens through which crisis conditions are interpreted and responded to.

Phase one - Trigger event (March 2020)

Innovation-Focused Crisis Interpretation

Unlike in the previous two case, this *High Growth Enterprise's three* initial crisis response demonstrates quick technological adaptation and immediate sense-making that instantly connected crisis conditions with existing capability deployment opportunities:

> *"Fortunately, 90% of the work I can do from home, so it has not been that terrible, but it is challenging with schools being closed. We tried to use some of our equipment and create shields and other materials that local hospitals can use. So, in the past few days, we were just running around, trying to find supplies to make that happen"*

This statement contains multiple layers of crisis sense-making worthy of detailed analysis. The quantified assessment of remote work capability *"90% of the work"* demonstrates analytical precision in evaluating operational possibilities, suggesting evaluation of work manageableness rather than vague assessment. This represents what Weick (1995) would identify as "extracted cues" processing that focused on specific operational metrics to anchor understanding during uncertainty. The phrase *"we tried to use some of our equipment"* reveals immediate recognition of technological capability redeployment possibilities, where the use of *"tried"* suggests experimental rather than predetermined thinking, indicating effectuation logic that explored available means rather than pursuing fixed goals.

The identification of *"shields and other materials"* shows understanding of medical equipment needs and technical capability matching, where the phrase *"running around, trying to find supplies"* reveals the practical challenges of rapid innovation under supply chain disruption, demonstrating bricolage behaviour (Baker & Nelson, 2005) that creatively sourced materials for novel applications. Where again, such behaviour reveals enactive sense-making that quickly tried to construct crisis conditions as innovation opportunities rather than purely disruptive constraints, that again represents what Weick (1995) would recognise as environmental enactment that created positive possibility within crisis conditions.

Similarly to the previous case HGE-2, the HGE-3 also focus on value creation, where their fundamental strategic reorientation shows value-based crisis sense-making and desire to support local communities that were severely impacted by the initial Covid-19 influence:

"So, right now, what we are trying to do now is just support and help the local community health-wise as we are quite well placed in the Inverness now. We can still work and accept orders, but our priorities have shifted more towards life science"

This statement demonstrates multiple sense-making processes, where the phrase *"what we are trying to do now"* indicates active strategic choice rather than passive response, showing maintained agency during crisis conditions, and where the emphasis *on "support and help the local community health-wise"* reveals ethical capabilities in sense-making that integrated

community responsibility with business capability deployment. The locational analysis where ER-3 stated *"quite well placed in the Inverness"* demonstrates geographical analysis and sense-making process that understood the proximity advantages to healthcare facilities, as this represents strategic thinking about physical positioning as competitive advantage during crisis conditions.

Such a quick re-orientation and strategic shift towards *"life science"* again, indicates a rapid sense-making process with a sector reorientation based on crisis needs assessment. This represents a crisis *"market sensing"* that identified where organisational capabilities could create maximum value during emergency conditions.

During this phase, this enterprise HGE-3, just like the two previously discussed cases engaged in practical assessment of operational challenges that revealed realistic crisis planning and replanning:

"In terms of our growth strategies, we were supposed to get a graduate to come and work for a few months, so now this has been put on hold. This means that any additional work around the things we were supposed to develop along with a graduate are now postponed as well"

This demonstrates resource triage (the assigning of priority order) thinking that distinguished between essential and postponable activities. The graduate recruitment suspension shows understanding of training complexity during remote work conditions and uncertain business environments caused by the Covid-19 crisis. The recognition that postponing graduate recruitment affected associated development projects shows thinking about resource interdependencies and project planning complexity during crisis conditions. The system thinking is a viable strategy in the process of a problem-solving that views problems as part of a larger, interconnected system, rather than isolated components.

Understandably, the crisis impact on international development reveals significant strategic cost and revaluation of future plans and what is possible in the new conditions. This is where the HGE-3 shares the following:

"We were supposed to travel to the US, which HIE was funding as a part of Brexit support and we were supposed to visit a number of different conferences and trade shows, so now all of them have been cancelled"

This represents substantial strategic opportunity cost for the enterprise, to explore and expand to the US market due to the challenges caused by Brexit, where the multiple conference cancellations indicate comprehensive disruption of international expansion strategy, requiring fundamental strategic timeline revision. Additionally, their approach to external information support reveals self-reliance assessment, especially during such a challenging time:

"I am not quite sure what to expect from HIE, so we are just trying to work and relay on ourselves. So, for now, I am not expecting much from them"

This statement reveals realistic assessment of external support limitations during crisis conditions, where the phrase *"relay on ourselves"* indicates preference for autonomous action rather than waiting for external guidance, showing self-reliant crisis management orientation.

Phase two- Reorientation and Crisis Layering (April 2020-June 2020)

Pivoting Strategy, *Sense-Making and Information Management*

During this second phase the HGE-3 continued working on the mass production of protective gear and equipment for local communities and hospitals, that were severely affected by the crisis. Their detailed analysis of equipment utilisation provides evidence of crisis capability positioning:

"I think there are over eight thousand face shields, out in the health service locally, made using the laser cutter. And if we did not have that, we could find a way to do it. It would have probably been slower, more expensive, and tied up more manpower... But if we did not have the laser cutter...this would either be outsourcing, which from the initial costs we have got, would be prohibitively expensive. Because the time that we would be paying for someone else to make these parts would just be too much"

This statement provides specific quantitative evidence of quick production achievement, since the production of *"over eight thousand face shields"* within weeks represents noteworthy scaling from zero to mass production, demonstrating how technological infrastructure enabled rapid crisis response. The ER-3 analysis of alternative manufacturing approaches uncovers advanced strategic thinking, as this detailed cost analysis demonstrates understanding of manufacturing economics and outsourcing implications. The recognition that outsourcing would be *"prohibitively expensive"* or *"just be too much"* for rapid iteration shows understanding of how crisis conditions affected manufacturing and procurement processes.

The comparative analysis of alternative production methods that was share by ER-3 revealed the enterprise's advanced manufacturing strategy thinking, as they shared their decision to quickly invest in the new laser printed:

"So that decision to get the laser cutter was heavily influenced by being able to get the supports, the investment support, and that laser cutter has been invaluable for what we are doing. And we are refining the design of the visor to come up with something that is almost entirely laser cut"

This shows how pre-crisis strategic investment (HIE-supported laser cutter purchase) created unforeseen crisis capabilities, where the design refinement towards *"almost entirely laser cut"* shows continuing innovation and attempted optimisation based on available

technological capabilities. The analysis and sense-making process continues with injection moulding considerations and outsourcing considerations, where the ER-3 shares:

"If they were doing laser cutting, so we would have to look at a different manufacturing process. And we would probably go down the route of injection moulding and if you go to an injection moulding, you have to be talking in tens of thousands of units before that makes sense...Whereas if you are outsourcing to an injection moulding company, you probably be weeks to get the tooling done. Then, another week or so to get the parts. And if you needed to make changes, you might be able to reuse the tools that have been made up. Or you might have to start again from scratch, which is expensive"

This reveals complex understanding of manufacturing process and volume requirements, where the recognition that injection moulding requires *"tens of thousands of units"* to achieve economic viability demonstrates advanced manufacturing strategy knowledge. The HGE-3 analysis of crisis market dynamics again, reveals understanding of emergency procurement requirements, where this detailed timeline analysis demonstrates understanding of how traditional manufacturing timelines became incompatible with crisis urgency. Additionally, the customer urgency analysis provides crucial insight into crisis market dynamics:

"Having that resource in the house [3D printer] *has meant we have been able to very quickly iterate. And the response to sort of COVID-19 PPE requirements has been, people needing stuff fast. Like we get a call from the hospital saying, the ICU saying we need a thousand, when can you get them?"*

The specific example of ICU requesting *"a thousand"* units with almost immediate delivery requirements illustrates the extreme urgency of crisis procurement, as the phrase *"when can you get them?"* captures the time-critical nature of crisis market dynamics where speed became the primary competitive advantage. This further highlight how crisis conditions activated innovation support mechanisms that enabled rapid product development.

It is evident, that HGE-3 is highly innovated and motivated enterprise, and they were looking for opportunities to utilise their skills and knowledge where possible, especially in the new uncertain crisis conditions, as they quickly understood, that tough times create new prospects. This is also evident from the below statement by ER-3, where the continuous sense-making is also present:

"Because we work in an area where we like to make, we like to innovate, we like to make improvements, we like to solve problems. And when you have kind of got normalities happening, then everything's kind of running along, lots of people making small incremental changes. When there is a big shakeup, to normality, like this COVID crisis, when quick change, quick innovation can have a real impact. And that is what we can be quite good at. This is why we have turned from being a desk-based design consultancy, into turning out those face shields in a couple of weeks"

This statement provides rich evidence of enterprise's identity construction, crisis opportunity interpretation, and innovation capability self-assessment, represents identity construction that establishes innovation as core organisational characteristic rather than peripheral activity. Furthermore, the ER-3's analysis of normal versus crisis conditions demonstrates environmental scanning and opportunity recognition. That reveals important insights about normal market dynamics and innovation patterns. The phrase "*everything's kind of running along*" suggests steady-state conditions where innovation occurs but follows predictable patterns, where the characterisation of *"lots of people making small incremental changes*" demonstrates understanding of normal innovation as distributed, gradual, and competitive.

As ER-3 continuous the discussion, this is where their abilities on the analysis of crisis conditions as innovation opportunity represents particularly and highlights strategic thinking. Phrases such as *"big shakeup to normality"* demonstrates understanding of crisis as structural disruption that changes competitive dynamics and innovation requirements, the disruption creates new possibility spaces where different capabilities become valuable. Furthermore, *"quick change, quick innovation can have a real impact"* highlights enterprise's understanding of how crisis conditions create time pressured innovation opportunities where speed

becomes more valuable than optimisation, where the phrase *"real impact"* suggests understanding that crisis creates conditions where innovation can achieve significant outcomes that might be impossible under normal competitive conditions.

The concluding statement provides clear evidence of enterprise's evolution in speed and scope, across different dimensions. Firstly, their business model rapid change and evolution from *"desk-based design consultancy"* to "*turning out those face shields"* represents transformation from service provision to product manufacturing, where this indicates operational model change enabled by crisis conditions. Physical transformation is also evident in the contrast between *"desk-based"* (sedentary, conceptual work) and *"turning out"* (active production) indicates transformation from intellectual service delivery to physical product manufacturing. Secondly, the timeline compression as *"a couple of weeks"* for such intense business model transformation represents enterprise's agility and adaptation speed that challenges traditional change management timelines. The phrase *"this is why"* connects innovation identity and crisis opportunity recognition with successful transformation, suggesting understanding of causation between organisational characteristics and crisis response capability.

Phase three- Route Map Implementation (June 2020-September 2020)

Information Flow and Opportunity Identification

During this third phase, as anticipated, the HGE-3 continued to engage with various external bodies to scan for possible funding opportunities and pivot the business further to capture new opportunities. Their approach to funding opportunity identification reveals clever ecosystem navigation, where this is what ER-3 mentioned about the enterprise's resource identification:

"So, there were some funding calls that had been about recently that were kind of relevant to what we were doing. We have had a few imperative feedback from two or three sources, which meant that we just in an application or another funded project"

The phrase *"two or three sources"* indicates diversified information gathering that reduced dependence on single information channels, where the description of information as *"kind of relevant*" suggests flexible interpretation of funding criteria to identify applicable opportunities. In terms of their approaches to analysis of the funding opportunities and strategic resource assessment, the ER-3 shared the following approach:

"We see what is available in terms of funding. And for what we could be asking for. News funding streams are available at the national level to Covid-19 innovation funds, which are quite sustainable at the nation funds"

Where this shows environmental scanning capabilities, funding landscape analysis, and strategic resource assessment that demonstrates understanding of innovation funding ecosystems during crisis conditions. The phrase *"we see"* and *"what we could be asking for"* suggests active environmental scanning rather than passive information reception, thus indicating systematic approach to observation of funding landscapes that goes beyond waiting for opportunities to be presented through formal channels. This represents Weick's (1995) "extracted cues" processing where the enterprise actively scans environmental signals to identify resource opportunities, as again, this phrase suggests *proactive* sense-making that seeks out rather than merely responds to funding possibilities.

Additionally, the mention of *"at the national level"* funding indicates understanding of funding hierarchy, as there were also various funding opportunities options at the local level, that tended to be much smaller and more competitive. This demonstrates awareness that crisis funding operates across multiple governmental and institutional levels with different criteria, timelines, and resource scales. The specific identification of *"Covid-19 innovation funds"* shows targeted environmental scanning that focuses on crisis-specific rather than general funding opportunities, indicating adaptive information filtering that prioritises relevant opportunities.

The ability to identify *"new funding streams"* during rapidly changing crisis conditions demonstrates dynamic environmental scanning that adapts to accelerated policy

development and institutional response timelines. Furthermore, the HGE-3 assessment of market recovery demonstrates clever environmental scanning via the engagement with various external bodies that are responsible for funding allocation and obtaining the information on how other businesses 'are doing' during this uncertain time, thus helping them to make an informed decision on how to procced:

"They are [external supporting government bodies] *starting to see inquiries from other companies coming through, where they are starting to get back to work. Maybe they have had a bit of a slow down or a pause, or they have been sticking to their core essential stuff for a while. They are now starting to get back to work and are starting to do inquiry"*

This approach highlights ecosystem intelligence gathering that demonstrates how enterprises can access market recovery signals through institutional intermediaries, representing a particularly advanced form of environmental scanning that leverages network positioning for competitive advantage and insights into Covid-19 crisis affected environment. This is because HGE-3 saw that the government bodies serve as information aggregators that provide ecosystem-wide visibility beyond what individual organisations could observe directly.

Furthermore, the phrase *"sticking to their core essential stuff"* when talking about other enterprises shows understanding of crisis prioritisation patterns where organisations reduce activity scope to essential operations only. This provides crucial competitive intelligence about market recovery timing and competitive activity levels exhibited by this enterprise, where "*getting back to work"* coupled with *"starting to do inquiries"* represent early warning signals of possible market recovery that precede actual project commitments or revenue generation, that was cleverly noted by HGE-3.

This third phase was strongly associated with continuous sense-making and making sense out of the surrounding environment and deciding to move certain direction based on the external resource availability. In later stage of this phase, this is what ER-3 shares:

"We are trying to deal with lots of business development things that we are going to working on. But there is a lot of kind of inquiries out there that are all getting, a little bit of attention so it is taking a bit of time. Trying to focus a little bit more on us taking a lead in targeting for areas we want to work in rather than just sit back and waiting for inquiries to come in... We are at the point where we sort of making sense, we have got some ideas, we were looking at possible funding streams. We will be chatting with somebody, trying to figure out what kind of support might be available. And I think we are usually quite good at figuring out who the right person to talk to, we often go straight to them"

It can be seen that a strategic evolution from reactive to proactive business development, demonstrating enhanced organisational confidence, strategic focus development, and network navigation capabilities that represent important crisis learning integration and strategic maturity development are present here. This demonstrates cognitive resource allocation challenges during uncertain times and attempted recovery, where opportunity abundance creates attention division, as the phrase *"lots of business development things"* indicates multiple simultaneous opportunities that require strategic prioritisation rather than simple response capacity. The phrase *"it is taking a bit of time"* indicates temporal pressure awareness where distributed attention creates opportunity cost through delayed response and reduced strategic momentum, where the recognition that inquiries are *"all getting a little bit of attention"* shows understanding of resource dilution effects that reduce strategic focus temporarily.

The phrase *"making sense"* represents capabilities of crisis learning and market intelligence into reasoned strategic understanding, that can also demonstrate retrospective approach into sense-making that combines accumulated experience into actionable strategic insights. Lastly, the phrase *"quite good at figuring out who the right person to talk to"* represents capabilities in network access intelligence that enables efficient resource access through direct relationship targeting rather than through generalist relationship channels.

Phase four- Stabilisation Period (September 2020 - January 2021)

Strategic Development, Readaptation and Long-Term Investment Planning

At the beginning of this forth phase, the HGE-3 started to think about their long-term goals and enterprise's direction, where given the varied of funding opportunities available (brought on by the Covid-19 crisis impact), they started looking into various options on where to move their office and production space in the near future. This is where the ER-3 shared some of the preliminary ideas they had so far:

"There is a possibility that we are looking at taking a lease on some lands on the campus and building our own office. A three-year lease, so it will be running over in a couple of years. We need to be moving on to somewhere else, so we are looking at options for what we will do... So, just now, we looking into some talk going between HIE and the Scottish Government looking at the sort of the Life Science Enterprise Area, because that can give five years' worth of reach relief, which is not, not an inconsiderable? No, not a small amount, you know, it's potentially worth about £100 grand over the course of it. And, so, and we're kind of edging forward to those discussions, but that's all coming from going directly to other people"

This highlights several important strategic developments, as the consideration of land lease and building construction indicates significant capital investment planning that demonstrates confidence in organisational continuity and growth prospects, despite prominent crisis conditions. The three-year planning horizon shows temporal strategic thinking that extended well beyond immediate crisis conditions toward fundamental infrastructure development, as this represents strategic recovery that moved beyond crisis survival toward growth-oriented development. Furthermore, the discussion around specific financial quantification of strategic opportunities, such as the "*£100,000"* potential value over five years demonstrates detailed cost-benefit analysis that informed long-term strategic decision-making. The recognition of multi-institutional negotiations "*between HIE and the Scottish Government*" shows understanding of complex policy development processes and strategic patience required for institutional decision-making.

Furthermore, dur to Covid-19 restrictions, just like any other enterprise, the HGE-3 had to rethink on the actual working conditions, given the restricted environmental landscape:

“I've gone back with an email and a list of some equipment that we feel kind of needed, sort of brought on by the way, we've changed how we work for COVID stuff that we need to investment in equipment. It is kind of, you know, laptops and other stuff for homeworking. Some software licenses that normally we use a kind of shared stuff in the office. Normally you shared stuff in the office, but we cannot do that now. So now we have to try and get additional licenses. Yeah, so it is that kind of stuff”

This provides detailed evidence of how crisis conditions demanded fundamental operational model changes that required resource reconfiguration, showing HGE-3’s understanding of technology infrastructure requirements and organisational adaptation challenges during forced remote work transition. The phrase *"the way we've changed how we work"* demonstrates previously mentioned organisational adaptation that went beyond temporary adjustment to acknowledge fundamental operational transformation, where the acknowledgment that Covid *"brought on"* these changes shows understanding of external constraint as transformation catalyst rather than temporary disruption.

From the resource-based perspective (Barney, 1991), this represents capability reconfiguration as converting shared physical resources into distributed digital resources that enable equivalent operational capability under changed environmental conditions. The technology investment potentially creates enhanced operational capabilities that provide competitive advantages through improved flexibility, where the home working infrastructure becomes strategic asset that enables operational continuity during potential future disruptions cause by this crisis.

Phase five- Second Lockdown (January 2021 - March 2021)

Enhanced Sense-Making Competence

With an introduction of the second national lockdown, the HGE-3 was mostly well prepared, due to the prior learning and recognition that Covid-induced changes require permanent operational adaptation rather than temporary crisis accommodation. What can be seen in the below quote is that the enterprise's response to second lockdown shows overarching adaptation:

"So just know, as I say, we've got this little bit of funding to help us work better from home, which should help us. But moving into the second national lockdown, I didn't notice a difference because I hadn't changed. We're working from home anyway... It was a catch-up to see if you can go and start buying some equipment, that's going to help us work from home better. It does help us for more international or long-distance clients. Because there's some equipment, it has to do with making it easier to have kind of brainstorming whiteboarding sessions, from all over the world when you're not in the same room as a person"

The phrase *"I didn't notice a difference"* represents overall crisis adaptation and preparedness, where second lockdown did not create any additional operational disruption. This indicates operational model transformation that normalised and accepted remote work to the extent that lockdown restrictions became irrelevant to daily operations. The proactive equipment acquisition that was mentioned in the previous phase as well (showcasing in advance preparation due to forthcoming crisis uncertainty) as *"little bit of funding to help us work better from home"* demonstrates anticipatory planning that enhanced rather than merely maintained operational capability during remote work conditions. This sense-making process shows HGE-3's strategic thinking and planning about capability enhancement, as strategic equipment investment would allow for prospective competitive advantages extending beyond crisis requirements. The focus on *"brainstorming whiteboarding sessions"* with international clients shows in-depth understanding of how collaborative technology could enhance service delivery capabilities.

When HGE-3 was asked about the impact from the Covid-19 crisis and what this meant for them, the ER-3 shared their experience of swift business model readaptation and transformation, thus showcasing precise evidence of crisis enabled business evolution:

*"We usually consult, and we've never sold a product before. But we sold over 10s and 100s. If I could think of the same thing, include people we've had chats with, we've probably up over about getting towards 20,000 face shields, which wasn't something that we'd ever done before. And we were able to get through that quite quickly... But I think what we learned from that experience was, if you want to get something done, just do not wait to be told or asked, just go and do it. So, when requirements came out, my colleague P** is quite good at getting contacts, he can usually get information at random if he needs to find the right person to speak to us in NHS and at the Scottish/UK Government trying to find out what we could do to help"*

This again showcases their swift business model transformation from pure consultancy to manufacturing and product sales, where the production and sale of approximately 20,000 face shields represents remarkable scaling achievement within months of crisis onset. The phrase *"wasn't something that we'd ever done before"* emphasises the radical nature of capability development and business model evolution enabled by crisis conditions and innovation infrastructure. In the second half of the quote can be seen the enterprise's reflection on crisis learning that shows organisational learning that obtained actionable values from crisis experience. The emphasis on self-directed action *"just go and do it"* represents important learning about the value of initiative over permission-seeking during crisis conditions. The detailed description of networking capability *"he can usually get information at random if he needs to find the right person"* reveals refined network navigation skills that enabled rapid crisis response and solution development.

Furthermore, the ER-3 shared their detailed analysis of production timelines that essentially provides important insights into crisis market dynamics. There are also a few interesting insights into the HGE-3's communication strategy during the crisis, relationship development and opportunity recognition:

“There is all the chat about 3-D print bits of ventilator so we could rapidly produce. And there were lots of talk on about how something could be done, something was needed in business. So, we just kind of put together a list of potential things and said, right, we've seen these items mentioned, you went straight to the guys at the hospital to see it right: ‘We're an engineering company, we can do that for prototyping. We're based just across the line from you guys. These are the things that we understand that your needs, we think we can help you with this, this is does that match your understanding?’ And I think we went from a chat on a Friday that figured out what the requirement was and by the end of that week, we've delivered our first batch. So, we delivered the first box of 500. Because we just kind of got up and did it...There are so many stakeholders trying to get involved that they were kind of waiting to get a good understanding from all the different stakeholders. And if we waited for that, we'd have kind of missed the moment”

This reveals their approach to opportunity identification and direct customer validation that bypassed complex stakeholder coordination processes, where the evidence of rapid innovation execution is clear, with direct customer engagement, and strategic decision-making that demonstrates how speed and simplicity can create competitive advantages during crisis conditions. The direct hospital engagement *"went straight to the guys at the hospital"* shows understanding of how speed required simplified decision-making channels, where the rapid execution and development *“Friday requirements discussion”* to *“end of week delivery of 500 units”,* showing notable execution speed that compressed traditional development cycles from weeks or months to days. Similarly, the 500-unit first batch indicates immediate production scaling rather than prototype development, demonstrating manufacturing capability and confidence in design solution, where the confidence was coming from prior experience of developing face shields in the first few months of Covid crisis. This aligns with effectuation theory (Sarasvathy, 2001) principles of rapid experimentation and immediate action with available means rather than extensive planning and resource optimisation.

This was already mentioned, but this HGE-3's action-oriented autonomous approach is worth mentioning again, where the phrase *"because we just kind of got up and did it"* captures action-oriented attitude that prioritised execution over planning and immediate response over comprehensive analysis, where the casual language masks significant strategic decision-making and execution capability exhibited by this enterprise. Furthermore, the ER-3 analysis of stakeholder coordination challenges reveals understanding of various institutional response limitations and multi-stakeholder coordination problems during crisis response. The phrase *"if we waited for that, we'd have kind of missed the moment"* reveals capabilities of competitive timing analysis that recognised bureaucratic delay as opportunity window closure for agile organisations. Where their analysis of market timing provides important insights into crisis market dynamics:

"Later on, we did wait a little bit more before we press the second iteration of the face shield. And because of that, we kind of missed the moment again. And that second iteration, we saw the first iteration we sold to cover our costs. But we said we're very clear, we're not going to make profit on this. So, we sold it to cover our costs and ended up selling more than we thought we would, which meant we made a profit, which we then give away to charity...The second wave, we said, 'Hey, we're going to do these other commercial products.' So, we invested in them. And because we kind of delayed a little bit to make sure everything was right before, we kind of by the time we got those finished and approved, the moment is kind of passed"

This provides evidence of how crisis markets created time-sensitive opportunity windows where delay, even for quality improvement, could result in market opportunity loss. The comparison between first iteration *"cost recovery"* and second iteration *"commercial intent but financial loss due to timing"* demonstrates understanding of crisis market dynamics, where the phrase *"the moment is kind of passed"* captures how rapidly crisis market conditions could shift, making previously viable opportunities obsolete within weeks.

Lastly, talking about the key learning outcomes during the crisis period, the ER-3 shared a reflection on confidence development that highlighted their important strategic outcomes:

"And it's given our company a bit more confidence now to be able to give us more confidence to think that we can just go out and do this, we can just go and make a product. It's given a great case study example to say, we went from sketch to ideas to see marked products within two months"

This demonstrates how crisis success created lasting organisational confidence that expanded perceived capability boundaries beyond traditional consulting services, as the phrase *"we can just go out and do this"* represents significant psychological development that enhanced enterprise's ambition and strategic possibility perception. The mention of a case study development *"went from sketch to ideas to see marked products within two months"* provides compelling evidence of rapid innovation capability that could be leveraged for future business development and client engagement. This conversation highlights the understanding of how crisis conditions created different competitive dynamics where speed became more important than optimisation. The HGE-3's learning that delay for quality improvement could result in market opportunity loss provides important insights into crisis market dynamics and timing criticality.

In conclusion, this third case of *High Growth Enterprise* demonstrates unusual crisis management achievement through technological capability deployment, innovation ecosystem utilisation, and rapid adaptive sense-making. The evident transformation from design consultancy to a medical equipment provider within weeks represents significant organisational evolution enabled by pre-existing technological infrastructure, network relationships, and innovation capabilities.

The empirical evidence illustrates how technological preparedness, strategic positioning, resource acquisition and network capabilities can enable crisis response that creates significant social value while developing lasting organisational capabilities and competitive advantages. The production of approximately 20,000 face shields while altering business model illustrates how crisis conditions can cause enterprise development through innovation-driven sense-making and rapid adaptive learning. This case further demonstrates the importance of understanding sense-making as capability-dependent interpretation (where

what an organisation can do shapes what it sees as possible), thus creating competitive advantages and improved organisational confidence that extends far beyond crisis conditions.

Characteristics	Key Events & HG3 Enterprises' Responses	Theoretical and Organisational Insights
Phase 1: Trigger Event		
Innovation-Focused Crisis Interpretation	WHO pandemic declaration and UK lockdown • Assessed 90% of work could be done from home • Immediately identified opportunity to create shields and materials for local hospitals • "Running around, trying to find supplies"	Extracted cues processing • Analytical precision in operational assessment • Immediate technological capability redeployment recognition • Effectuation logic with experimental thinking
Technological Capability Leveraging	Used existing equipment (laser cutter, 3D printer) to produce medical supplies • Rapid prototyping capabilities enabled quick response • Created shields and protective materials	Bricolage behaviour • Creative material sourcing under supply chain disruption • Enactive sense-making constructing crisis as innovation opportunity
Community-Focused Value Creation	Prioritised supporting local community health-wise • Strategic positioning in Inverness near healthcare facilities • Shifted priorities towards life sciences sector	Value-based crisis sense-making • Community responsibility integration • Geographic advantage analysis • Crisis market sensing for maximum value creation
Phase 2: Reorientation and Crisis Layering		
Mass Production Achievement	Produced over 20,000 face shields for local health service using laser cutter • Detailed cost analysis of alternative manufacturing approaches • Recognised laser cutter investment as crucial for rapid response	Quantitative evidence of scaling achievement • Strategic thinking about manufacturing economics • Pre-crisis investment creating unforeseen crisis capabilities • Advanced manufacturing strategy knowledge

Innovation Process Optimisation	Refined design towards "almost entirely laser cut" production • Comparative analysis of injection moulding versus laser cutting • Understanding of volume requirements and timeline implications	Continuing innovation and optimisation • Complex manufacturing process understanding • Crisis market dynamics recognition • Advanced strategic analysis
Crisis Market Response	Rapid iteration capability through in-house resources • ICU requesting "a thousand" units with immediate delivery • Speed became primary competitive advantage	Crisis market dynamics understanding • Time-critical procurement recognition • Innovation infrastructure enabling rapid development • Competitive advantage through speed
Business Model Transformation	Evolved from "desk-based design consultancy" to manufacturing face shields in "couple of weeks" • Identity construction around innovation and problem-solving • Recognition of crisis as opportunity for "real impact"	Identity construction • Business model rapid transformation • Crisis opportunity interpretation • Innovation capability self-assessment • Environmental scanning of normal versus crisis conditions
Phase 3: Route Map Implementation		
Funding Ecosystem Navigation	Identified relevant funding calls from "two or three sources" • Applied for Covid-19 innovation funds at national level • Flexible interpretation of funding criteria	Diversified information gathering • Environmental scanning capabilities • Strategic resource assessment • Active rather than passive information reception
Market Intelligence Gathering	Monitored other companies' recovery through government bodies • Observed businesses "getting back to work" and "starting to do inquiries" • Used institutional intermediaries for ecosystem visibility	Ecosystem intelligence gathering • Market recovery signal identification • Competitive intelligence about recovery timing • Early warning signals recognition

Strategic Evolution Development	Moved from reactive to proactive business development • Focused targeting rather than waiting for inquiries • Enhanced network navigation capabilities • "Quite good at figuring out who the right person to talk to"	Strategic evolution from reactive to proactive • Cognitive resource allocation management • Network access intelligence • Crisis learning integration and strategic maturity
Opportunity Management Challenges	Managing "lots of business development things" simultaneously • Multiple inquiries requiring attention division • Recognition of temporal pressure and resource dilution	Opportunity abundance creating attention challenges • Strategic prioritisation requirements • Resource dilution effects understanding • Temporal pressure awareness
	Phase 4: Stabilisation Period	
Long-Term Infrastructure Planning	Considered taking lease on campus land and building own office • Three-year lease planning horizon • Explored Life Science Enterprise Area with potential £100,000 five-year rate relief	Significant capital investment planning • Confidence in organisational continuity • Temporal strategic thinking beyond crisis • Multi-institutional negotiation understanding
Operational Model Adaptation	Invested in equipment for homeworking (laptops, software licenses) • Converted shared office resources to distributed digital resources • Enhanced remote collaboration capabilities	Fundamental operational transformation acknowledgement • Resource reconfiguration requirements • Technology infrastructure strategic importance • Capability reconfiguration for competitive advantage
Technology Enhancement Focus	Acquired equipment for better international collaboration • Enhanced brainstorming and whiteboarding capabilities for global clients • Proactive equipment acquisition for competitive advantage	Strategic thinking about capability enhancement • Anticipatory planning for improved service delivery • Technology investment for prospective advantages • International service delivery capability development

Phase 5: Second Lockdown		
Crisis Normalisation Achievement	"Didn't notice a difference" during second lockdown • Already working from home effectively • Operational model transformation complete	Crisis adaptation and preparedness • Operational model normalisation • Remote work transition complete • Crisis resilience through adaptation
Business Model Evolution Reflection	Transformed from pure consultancy to manufacturing approximately 20,000 face shields • "Never sold a product before" to large-scale production • Learning: "If you want to get something done, just do not wait to be told"	Remarkable scaling achievement • Radical capability development • Business model evolution enabled by crisis • Organisational learning with actionable insights • Self-directed action value recognition
Rapid Innovation Execution	Friday requirements discussion to end-of-week delivery of 500 units • Direct hospital engagement bypassing complex stakeholder processes • Speed and simplicity creating competitive advantages	Rapid innovation execution capability • Direct customer validation • Strategic decision-making under time pressure • Effectuation principles • Compressed development cycles
Market Timing Analysis	First iteration sold to cover costs, accidentally made profit (donated to charity) • Second iteration delayed for quality improvement, "missed the moment" • Recognition of time-sensitive opportunity windows	Crisis market dynamics understanding • Timing criticality recognition • Quality versus speed trade-offs • Market opportunity window analysis • Competitive timing intelligence
Organisational Confidence Development	Enhanced confidence: "We can just go out and make a product" • Case study development: "Sketch to market products within two months" • Expanded perceived capability boundaries	Lasting organisational confidence development • Psychological capability enhancement • Strategic possibility perception expansion • Crisis success creating lasting capabilities

Table 5.2 - Summary table of the HGE-3 case study that captures the key information across all five phases, Author 2024

Case four: Potential High-Growth Enterprise four (HGE-4)

A Potential High-Growth Enterprise four is a luxury hospitality products enterprise that operates in the luxury bedding and cashmere industry. Their primary activities include the production of cashmere duvets, pillows and other accessories. Enterprise four is small because it employs less than 49 people, more specifically one full-time entrepreneur (the owner of this small enterprise) and one part-time employee and began trading in September 2019, only a few months before the Covid-19 crisis declaration in March 2020.

Hospitality industry was severally impacted by the Covid-19 crisis, thus making this enterprise's operation and existence very challenging. Operating within the vulnerable hospitality supply chain, this company's response illustrates diverse crisis management practices that evolved across five distinct crisis phases, examining how crisis events triggered specific organisational responses and the mechanisms underlying these adaptations. The case provides unique insights into how extreme environmental conditions can simultaneously threaten survival while creating opportunities for fundamental capability development and strategic transformation.

Phase one - Trigger event (March 2020)

Immediate Cognitive Processing and Enterprise Disruption

The onset of the crisis was identified as March 2020 (the trigger event), marked by the World Health Organisation's (WHO, 2020) declaration of COVID-19 as a global pandemic and the subsequent implementation of a national lockdown. As it was mentioned before, this event initiated a period of severe uncertainty, characterised by a lack of guidance regarding which strategic responses would make positive outcomes for enterprise's stability. For HGE- 4, this initial phase of the crisis posed particular difficulties, as they had only launched operations in September 2019. With merely six months of trading experience, the company faced the crisis with limited market presence, a significant financial loan, and minimal revenue generation.

Just before the initiation of a national lockdown, the HGE-4 had put in place a number of strategic initiatives, such as participation in trade shows, conferences, and networking events,

that were essential for early-stage business development. The abrupt cancellation of these activities, combined with the severe disruption experienced by the hospitality sector (their primary target market), intensified the challenges faced. As the full scope of the crisis became apparent, HGE-4 initiated a process of organisational sense-making, prompted by the realisation that existing plans were no longer viable, and that rapid adaptation was necessary to ensure survival. Consequently, the firm began to explore new opportunities, marking the beginning of a broader strategic reframing. This initial phase is thus associated with assessing the crisis's impact on the business, identifying emerging needs, reprioritising goals, and restructuring operational routines. As it was mentioned before, the trigger event created an immediate requirement for fundamental capabilities in sense-making as the HGE-4 encountered the sudden collapse of their primary market. The initial response shows crisis cognition that moved rapidly from environmental scanning to strategic reorientation:

"In terms of my strategy and any growth plans, they are definitely being put on hold, mainly because my target market was luxury hotels, but now they are struggling, and this is not the best time for them. So, right now, I am focusing on things I did not get a chance to do before. I am quite positive, but it is also scary as things are changing every day"

The ER-4's immediate recognition of market disruption shows environmental awareness and scanning capabilities, where the understanding that the crisis represented not merely a temporary decline or dip but a vital disruption to the hospitality sector overall, where the immediate recognition of the nature of the crisis rather than viewing it as a temporary disruption. The phrase *"definitely being put on hold"* shows decisive action rather than hesitation or gradual adjustment. More significantly, the reasoning shows market analysis - understanding that their customers (luxury hotels) would be struggling and therefore unable to purchase, making it *"not the best time for them."*

This statement can be linked to what Weick (1995) characterises as *'retrospective sense-making'* as the cognitive ability to rapidly reinterpret past strategic commitments in light of significantly altered environmental conditions. Additionally, the temporal framing points to cognitive ability, where ER-4 states, *"right now, I am focusing on things I did not get a chance*

to do before" demonstrating ability to maintain multiple temporal orientations simultaneously without cognitive paralysis, which is essential for resilience, as well as resource reallocation and the identification of previously deferred opportunities.

Prior to crisis, in December 2019, the HGE-4 was able to acquire a loan, that made significant difference, as it provided a better resource position at crisis onset provided crucial context for their response capabilities. Nevertheless, the realities of this crisis rapid development forced the HGE-4 revisit their initial plans, where ER-4 shared the following:

"In terms of my business, it has been quite challenging to adjust and work from home, while kids are around...I am trying to use as much of this time working on digital development... After we come out of this, my growth trajectories are going to be very different, but I believe there are opportunities present as well"

The opening phrase highlights the immediate practical reality of crisis-imposed constraints, as the word *"challenging"* understates what was likely a significant disruption, suggesting SME's resilience and problem-solving orientation. The specific mention of *"kids are around"* (which was also mentioned in the previous case of HGE-3) indicates the blending of personal and professional spaces that many enterprises faced. The phrase *"adjust and work from home"* indicates active adaptation rather than passive acceptance, that suggests deliberate modification of working routines rather than simply trying to maintain previous approaches in new settings, thus revealing HGE-4's entrepreneurial flexibility and willingness to modify operational approaches when environmental conditions change.

The specific focus on *"digital development"* highlights strategic foresight about future business requirements and shift of focus on potential opportunities. This was March 2020, very early in the pandemic when the full implications of digital transformation needs were not yet clear to many enterprises, therefore, the HGE-4 immediate identification of digital development as a priority suggests market sensing and strategic anticipation. Perhaps most remarkably, even during the immediate crisis trigger phase, the ER-4 maintained forward-looking strategic thinking *"my growth trajectories are going to be very different",* as this shows

acceptance that fundamental change would be required rather than simple temporary adjustment. The confident claim that *"opportunities present as well"* demonstrates the ability to perceive potential advantages within crisis conditions, that is essential trait of resilience and can play a fundamental role in future survival.

Phase two- Reorientation and Crisis Layering (April 2020-June 2020)

Strategic Pivoting and Digital Transformation Decision

During this time, the ER-4 shed some light on the initial process of sense-making and crisis impact assessment, revealing the full scope of business model disruption and the emotional weight of strategic uncertainty, while attempting to maintain analytical clarity under severe pressure:

"The orders drop off and the events that I had planned to do this strategy for the next six months has effectively been torn out because all the events which were at least one or two month that I had planned to be at have now been cancelled. And that is now on hold. So, my business is very much up in the air as to where I will be selling, and I am sitting with a lot of stock. It is not a good place spot"

The ER-4 use language such as "drop off" to describe what was likely a dramatic revenue collapse, suggesting entrepreneurial emotional regulation that maintains analytical capability despite severe business disruption. The phrase implies revenue loss across the customer base rather than isolated customer problems, indicating the HGE-4 understood this was industry-wide disruption rather than company-specific challenges.

The detailed explanation the events that that have been cancelled shows strategic planning that had been destroyed by crisis conditions, where the use of "strategy" rather than "activities" suggests these events were not simply marketing tactics but integral components of strategic market development and customer acquisition. Again, the use of such language

such as "effectively been torn out" suggests abrupt disruption rather than gradual change, indicating the enterprise's recognition this is not a simple temporary delay.

The phrase "my business is very much up in the air" represents strategic uncertainty about basic business operations, coupled with complete uncertainty rather than partial confusion, indicating the recognition that crisis had eliminated established market channels and customer access methods. The specific focus on "where I will be selling" reveals understanding that the crisis had disrupted market access mechanisms rather than simply reducing demand, thus encouraging initial sense-making process of the previous business model analysis that understood the structural nature of crisis impact. The previous sales strategy had been location-dependent such as events, physical meetings, trade shows and that digital or remote sales capabilities were underdeveloped at this point., where such vulnerability assessment would prove crucial for subsequent strategic decisions about digital transformation investment.

The assessment *"I am sitting with a lot of stock. It is not a good place spot"* shows immediate operational and financial pressures created by demand collapse while inventory commitments remained fixed, as it had been acquired based on previous demand projections that were now obsolete. This inventory challenge represents what could be characterised as *'strategic asset liability'* - resources that were strategic advantages under normal conditions such as inventory to meet demand, event-based sales strategy but becoming liabilities under crisis conditions such as cash tied up in unsaleable inventory or inaccessible customers.

From the above mentioned, it is clear that the second phase and this period overall marked the HGE-4's most significant strategic decision such as the pivot to digital transformation. The ER-4's explanation reveals the reasoning process:

"I have applied for Hardship Fund... So, that I am working on plans to pivot and not messy change direction but just take us different route. So go about a different route and that is what I am working on myself...It will be a different route because my target audience has now, because I am in hospitality that has obviously, totally gone for the next year I would say. So, I am now looking at a more digital presence and building that and have actually invested in some for that myself to make that happen"

The careful distinction between *"not messy change direction but just take us different route"* highlights attempt towards strategic thinking and sense-making on the best course scenario to pivot the enterprise, but not abruptly. The ER-4 distinguished between chaotic change and purposeful redirection, indicating thoughtful strategic reorientation rather than panic response. The temporal assessment that hospitality had *"totally gone for the next year"* shows realistic market analysis rather than optimistic hope for quick recovery, while the decision to invest personally *"invested in some for that myself"* demonstrates commitment and confidence in the new direction.

The mention of the Hardship fund displays the ER-4's active pursue of available funding opportunities that were being released around this time due to the severity of the crisis impact. Since the HGE-4 was actively looking to pivot the enterprise's direction, the funding opportunities were being scanned very proactively, utilising various networking channels that the ER-4 had access to:

"I tend to reach out more broadly within my own network if there are things that I think I might get help... I wanted to move quickly [bypassing an account manager and HIE], *I just wanted to do it this way because it felt like the right thing for me to do at this point"*

The emphasis on speed *"I wanted to move quickly"* reveals crisis-driven decision-making where time constraints superseded collaborative approaches with previously established organisation and initial point for resource acquisition. The intuitive element *"it felt like the right thing for me to do"* demonstrates entrepreneurial decision-making under uncertainty where analytical approaches may be impractical.

Phase three- Route Map Implementation (June 2020-September 2020)

Pursuit to Resource Acquisition and Integration of Sense-Making

Moving into this third phase, the HGE-4 continued their pursuit of various resources, where ER-4 shared the following, highlighting strategic thinking operating under resource constraints and temporal uncertainty:

“Certainly, moving on the innovation front from where I've started, and we're looking at that as an opportunity as well. I am just a bit of a slog at the middle of trying to focus on the future, make the appropriate changes on the website, and effectively making decisions as well. But without knowing when [potentially will be a return to normality], without those additional funding that absolute to find out about. The Scottish government hardship fund will also help with what I'm trying to push forward. As well as just in general, trying to get consumers interested in the product”

The opening phrase *"certainly moving on the innovation front from where I've started"* reveals the crisis response capability as innovation advancement rather than defensive adaptation, where the word *"certainly"* indicates confidence in innovation progress despite crisis conditions, suggesting resilience that maintains forward momentum under adversity. The follow-up *"we're looking at that as an opportunity as well"* demonstrates cognitive reframing that views innovation development as opportunity creation rather than crisis response obligation.

Furthermore, the honest acknowledgment of mental challenges to balance everything highlighted by ER-4, demonstrates psychological challenges that many SMEs face during the crisis period, while maintaining commitment to strategic objectives. This emotional intelligence appears crucial for sustaining strategic effort through extended crisis periods.

The detailed description *"make the appropriate changes on the website, and effectively making decisions as well"* highlights simultaneous execution across multiple strategic dimensions, where such multi-dimensional execution capability demonstrates capacity for managing complex strategic implementation under pressure. The maintenance of quality standards "*appropriate*" and "*effectively*" despite time pressure and resource constraints suggests attempts to quality control and under crisis strategic implementation.

It should also be noted that the phrase *"get consumers interested in the product"* reveals the HGE-4 was pursuing direct consumer engagement rather than traditional B2B channels (as it used to be), indicating strategic pivot implementation, where the word "*trying*" suggests this market development remained challenging despite strategic reorientation.

Over the course of this crisis development, the overall HGE-4's resources strategy acquisition had evolved to utilise network and self-sourced support:

"I guess I am connected to a lot of support groups through my network. Also, an awful lot of free online stuff at the minute. So, most of my support is through things I am accessing myself through existing contacts or through, yeah, it would be existing groups"

This description highlights resource portfolio where the combination of "*support groups through my network*", "*free online stuff*" and "*existing contacts*" demonstrates multi-layered resource access, that necessary for SMEs, especially during the time of high uncertainty.

This phase overall was associated with significant cognitive load from managing multiple strategic initiatives simultaneously: innovation development, opportunity recognition, future planning, website development, decision-making, funding acquisition, and consumer engagement. The HGE-4's ability to continue execution despite timing uncertainty suggests enhanced resilience that enables sustained strategic effort under ambiguous conditions.

Phase four- Stabilisation Period (September 2020 - January 2021)

Enhanced Capability Development and Innovation Focus

By September, the HGE-4 was actively pursuing capability enhancement and innovation development, where it can be seen from the previous three stages was the prime focus of this enterprise. The beginning of this phase was associated with the continued sense-making and utilising benefits (e.g. acquired funds) to pivot the business in the new direction. Additionally, during this phase, the ER-4 renewed communication with their allocated account manager in HIE, as their communication was impacted and consequently reduced

due to the crisis associated workload increase on various Government organisations supporting SMEs through Covid:

"I was looking at more innovation. We were also looking at other two things. One is digital support to overview the work that has been done because I have been working with an independent digital guy, and it was useful. I asked [the allocated account manager]*, could he just have a look at what has been done today and just give us an overview of what he thinks, which he did come back with feedback areas and that was very useful. We also talked* [conversation between account manager and ER-4] *about a couple of areas of product development that I am working on at the minute. And there is still more information to gather but he* [the account manager] *said he would review that with the innovation team because it is another area of innovation"*

This statement shows that the HGE-4 was predominantly focusing on innovation development, indicating expansion beyond crisis response and moving towards more growth-oriented activities, given that during this time, the Scottish government began easing off some Covid-19 restrictions. Also, it can be seen, that HGE-4 was trying to utilise all available to them resources and due to the limited trading knowledge (only one year trading around this, that most of it was spent in the Covid-19 crisis environment), they were looking for both tangible and intangible resources where possible.

As it was mentioned before and this is where the word "more" suggests innovation had already been established as a strategic priority and was now being expanded, indicating transition from crisis survival to growth-oriented strategic development, where the follow-up *"we were also looking at other two things"* reveals structured approach to innovation management with multiple concurrent development streams. Additionally, the expansion into product development "*we also talked about a couple of areas of product development*" highlights strategic scope expansion beyond digital transformation that was previously mentioned to some potentially significant product innovation or focus differentiation. Overall, this highlights strategic coherence that integrates multiple innovation streams into development approach under the uncertainty. The structured approach to innovation

development is also present, especially in the phrase "*still more information to gather*" indicating preparation before resource commitment, that is essential for SMEs during uncertain times.

What can be further seen, is how HGE-4 improved their overall understanding of different funding types and their strategic applications, as there is a classification of resources, realistic assessment of business needs, and strategic thinking about funding utilisation during crisis condition can be seen:

"I got the hardship grant which is not innovation fund. It is just everybody applied for different things through COVID-19. That is what I got a grant which was basically to help me bridge the next number of months while there were little sales coming in because of what was happening"

The explicit distinction between "*hardship grant*" and "*innovation fund*" indicates the HGE-4 had developed nuanced knowledge of different resource types available during crisis conditions. Additionally, the temporal reference "*through COVID-19*" frames the funding as crisis-specific rather than normal business support, indicating understanding that these were emergency resources created to address pandemic-specific challenges, where this awareness suggests understanding of resource context and availability timeframes that are essential during this period.

The description "*I got a grant which was basically to help me bridge the next number of months*" reveals understanding of funding purpose as temporal bridge rather than permanent solution, where the word "*bridge*" indicates that this funding viewed as transitional resource to maintain operations until normal revenue streams could be restored or replaced. The mention of "*little sales coming in because of what was happening*" demonstrates clear understanding of the relationship between crisis conditions and revenue disruption, where this assessment enabled appropriate resource utilisation for survival needs while maintaining focus on strategic adaptation efforts.

The phrase "the next number of months" suggests realistic assessment of crisis duration and recovery timeframes. Rather than expecting immediate resolution or permanent support, the entrepreneur understood this funding provided finite time extension for strategic adaptation. This temporal realism appears crucial for appropriate resource utilisation and strategic planning.

The ER-4's observation of market dynamics reveals capabilities of the market sensing, since the presence of Covid-19 was no longer novel or shocking, and Scottish Government eased off a few restrictions, and by no people developed new buying habits and new approaches to surviving the challenging time:

"Actually, sales have just gone crazy. This last week, as of September, everybody is woken up to the fact that it is cold and the need to more duvet and pillows. So that has been really good for my business"

The phrase "*sales have just gone crazy*" indicates drastic enterprise performance improvement, where the market analysis was potentially undertaken, along with renewed seasonal patterns and consumer behaviour changes "*everybody is woken up to the fact that it is cold and the need to more duvet and pillows*", which was obviously reassuring for the ER-4 with the growing confidence in business performance and market positioning.

The growing confidence in capability development and resource acquisition suggests the emergence of strategic confidence in the ability to navigate challenges and pursue opportunities regardless of environmental conditions, where this development appears crucial for sustaining entrepreneurial action under uncertainty and may represent a key outcome of successful crisis navigation, especially in the case of this particular enterprise, due to limited trading knowledge, micro team to relay on and the hospitality industry halt and stagnation.

Phase five- Second Lockdown (January 2021 - March 2021)

Digital Transformation and Business Model Evolution

The final phase reveals the validation of crisis-period strategic decisions and the emergence of business model readaptation that was forced by a crisis induced conditions. Towards the end of the fourth phase, the HGE-4 mentioned applying for the digital grant, that they successfully received close to the fifth phase. This was significant to this particular enterprise, because it was mentioned before that digitally development was one of their main priorities throughout the whole crisis:

"The digital grand which really has well-transformed business at this point. I have been able to put a lot more effort into the digital front because you cannot go and see people or the hospitality industry which is our key mark. It is obviously an awful state. So, we have had to shift pretty quickly and focus more on consumers. That just means that our website has more of a consumer folding, and we are doing a lot of work on the back end of it. I got a really good guy brought in to help us which has been brilliant. Which is what the grant stand for. So, it is all very positive at the minute...I was not expecting this resource at all, and I have seen the light to get it as well. Because any help at the minute is great, everybody is in such a difficult situation. Money is being spent online but there is a lot of competition right there, so trying to be a part of that. Our website was basic, but it needed more content engagement and more optimisation, which is what we have done"

This statement demonstrates business model innovation where the creation of new value propositions through novel combinations of resources and capabilities. However, this case shows that this innovation emerged not from deliberate design but from crisis-driven experimentation that is more improved from the original business models, suggesting that crisis conditions may create opportunities for accidental business model readaptation. The ER-4's assessment "*we have had to shift pretty quickly and focus more on consumers"* where the shift from B2B hospitality sales to direct consumer engagement represents significant value chain reconfiguration that required developing new capabilities, relationships, and

operational processes. Additionally, the integration of digital and operational capabilities appears to have emerged through crisis-period learning, suggesting that extreme conditions may accelerate the development of operational complexity management capabilities.

The ER-4's assessment of resource acquisition timing reveals the emergence of strategic advantages that exceeded original crisis adaptation intentions "*I was not expecting this resource at all*", as this resource maintained crisis-driven adaptations. This created unexpected strategic advantages that exceed original adaptation objectives and helped in crisis navigation and created opportunities that were not visible during crisis onset. Furthermore, the ER-4's reflection on competitive positioning "*money is being spent online*" and "*our website was basic*" shows that crisis-driven digital transformation had positioned the company to compete effectively in accelerated digital markets, creating competitive advantages that extended beyond crisis adaptation to vital market positioning improvement.

Towards the end of this phase, the ER-4 shared the quantified results achieved during this timeframe, thus provide validation of strategic transformation effectiveness:

"We had everything lined up to do improvements on the website, to engage to interact with consumers; and, for example, in December, we acquired fifty new customers and forty new customers in January on the back of it. So, everything has really gone back to that digital grant that we got...My business had only been launched since September 2020. When we started looking at the changes that we could make, with what was happening with COVID, with knowing more about our customers, where to go for, or what to go for, and then with the funding able to put into work the things that needed to happen to enable that"

These metrics demonstrate effective market expansion that extended beyond crisis survival to genuine growth that exceeded pre-crisis performance levels, considering that HGE-4 was not trading for long before the crisis. This slow but still growth achievement during continued crisis conditions demonstrates the enterprise's ability to achieve positive performance outcomes despite continued environmental challenges. This capability suggests that crisis adaptations had created genuine competitive advantages rather than simply enabling survival

under adverse conditions. The overall reflection on the enterprise's evolution reveals the nature of transformation, as the crisis period represented not adaptation but fundamental business reinvention, indicating that extreme conditions may enable reinvention that exceeds original business potential. Additionally, the reflection on crisis-period learning reveals how extreme experiences create permanent capability enhancement *"everything has really gone back to that digital grant that we got"*, as this recognition of resource leverage demonstrates understanding that successful crisis navigation often depends on strategic resource acquisition timing rather than simply internal capability development.

This concluding conversation from March 2021 represents a moment of strategic and transformation validation, as ER-4 shared assessment of overall crisis navigation and successful business model readaptation:

"We are actually growing at this point which we were not. We had only launched fourteen months ago but, effectively, we lost the first seven months, from March through to September...but, effectively, by refocusing on the digital aspect, we are now on a growth trajectory and that is all working"

This represents evidence of strategic crisis-period decisions and sense making and transformations, where the growth achievement exceeded expectations by the use of word "*actually*". Additionally, the word "*growing*" rather than "surviving," "recovering," or "stabilising" (that were typically used during the crisis period) indicates the HGE-4 had achieved positive momentum and expansion, despite still operating in the crisis conditions.

This growth suggests the crisis-period transformations had created genuine competitive advantages rather than simply enabling survival under adverse conditions. The phrase "*only launched fourteen months ago*" emphasises the company's early-stage status when crisis hit, making subsequent transformation more significant. The word "*lost*" indicates the ER-4's viewed the initial crisis period as development time that could not be recovered rather than simply delayed progress, where this assessment suggests understanding that crisis conditions prevented normal business development rather than simply slowing it, indicating analysis of

crisis impact on enterprise's development processes. This further indicates the HGE-4 understood that crisis transformation had created essentially different business rather than recovered previous business model, where the phrase "*we are now on a growth trajectory*" suggests new strategic foundation and viewed crisis transformation as successfully completed rather than ongoing adaptation process.

It could be argued that this case four demonstrates that high-growth potential SMEs may possess hidden capabilities that prominently emerge under extreme conditions, suggesting that crisis periods serve not only as tests of organisational resilience but as catalysts for capability development and strategic innovation. The HGE-4 journey from crisis survival to strategic transformation reveals patterns of adaptation that created permanent competitive advantages rather than temporary crisis responses.

This case further demonstrates that high-growth potential SMEs may possess latent capabilities that emerge more prominently under extreme conditions, suggesting that crisis periods serve not only as tests of organisational resilience but as catalysts for capability development and strategic innovation. Additionally, the case illustrates that effective crisis management requires viewing crises as development opportunities rather than simply survival challenges, which is what ER-4 was attempting to do throughout this whole crisis 'journey'. The HGE-4's ability to extract strategic value from crisis adaptation suggests that SMEs with appropriate capabilities and orientations may emerge from crises stronger than they entered them, with enhanced capabilities, strategic positions, and competitive advantages that enable greater long-term performance.

Characteristics	Key Events & HG4 Enterprises' Responses	Theoretical and Organisational Insights
Phase 1: Trigger Event		
Immediate Cognitive Processing and Market Collapse	WHO pandemic declaration and UK lockdown • Primary target market (luxury hotels) struggling • Growth plans "definitely being put on hold" • Recognition that hospitality market would be unavailable	Environmental scanning capabilities • Retrospective sense-making • Rapid reinterpretation of strategic commitments • Market disruption analysis rather than temporary decline view
Resource Position Assessment	Recently acquired loan in December 2019 providing financial cushion • Only 6 months trading experience • Minimal market presence and customer base	Strategic asset evaluation • Resource position analysis • Early-stage vulnerability recognition • Financial preparation importance
Adaptive Response Initiation	Focusing on "things I did not get a chance to do before" • Working from home whilst managing childcare responsibilities • Immediate identification of digital development as priority	Multiple temporal orientation maintenance • Resource reallocation capability • Strategic anticipation of digital transformation needs • Entrepreneurial flexibility demonstration
Crisis Opportunity Recognition	"I believe there are opportunities present as well" • Acceptance that "growth trajectories are going to be very different" • Maintained forward-looking strategic thinking despite immediate pressures	Crisis reframing as opportunity context • Strategic possibility perception • Resilience through opportunity recognition • Fundamental change acceptance
Phase 2: Reorientation and Crisis Layering		

Strategic Business Model Disruption	Orders dropped off dramatically • All planned events for 6 months cancelled • "Business is very much up in the air" • Sitting with substantial unsold inventory	Strategic uncertainty management • Revenue collapse acknowledgement • Event-dependent sales strategy vulnerability • Strategic asset liability recognition
Digital Transformation Decision	Applied for Hardship Fund • Distinguished between "messy change direction" and "different route" • Personal investment in digital transformation • Recognition hospitality market "totally gone for the next year"	Strategic reorientation versus chaotic change • Thoughtful strategic redirection • Realistic market analysis • Personal commitment to new direction
Network-Based Resource Acquisition	Reached out broadly within personal network • Bypassed formal account manager channels • "I wanted to move quickly" • Intuitive decision-making approach	Crisis-driven decision-making prioritising speed • Entrepreneurial decision-making under uncertainty • Network leverage for resource access • Time constraint superseding collaborative approaches
Crisis Response Capability	Maintained analytical clarity despite severe pressure • Emotional regulation under business disruption • Strategic thinking operating under constraints	Crisis cognition maintenance • Analytical capability preservation • Emotional intelligence application • Psychological resilience demonstration
Phase 3: Route Map Implementation		
Innovation-Focused Strategic Development	"Moving on the innovation front" as opportunity creation • Making "appropriate changes on the website" • Pursuing direct consumer engagement instead of B2B channels	Innovation advancement rather than defensive adaptation • Cognitive reframing of crisis as opportunity • Strategic pivot implementation • Market development transition

Multi-Dimensional Execution	Simultaneous management of innovation, opportunity recognition, website development, funding acquisition, consumer engagement • Quality maintenance despite pressure	Complex strategic implementation under pressure • Multi-dimensional execution capability • Quality control maintenance • Strategic effort sustainability
Self-Sourced Support Strategy	Connected to support groups through network • Accessing "awful lot of free online stuff" • Utilising existing contacts and groups	Multi-layered resource access strategy • Self-reliant support acquisition • Network-based resource portfolio • Crisis period resource diversification
Temporal Uncertainty Management	Operating "without knowing when" normality would return • Maintained strategic commitment despite timing uncertainty • Enhanced resilience under ambiguous conditions	Ambiguity tolerance development • Strategic effort sustainability • Temporal uncertainty navigation • Enhanced resilience capability
Phase 4: Stabilisation Period		
Enhanced Capability Development	Renewed communication with HIE account manager • Pursuing innovation development with independent digital consultant • Multiple concurrent innovation streams • Product development expansion	Transition from crisis survival to growth-oriented development • Structured approach to innovation management • Strategic scope expansion beyond digital transformation • Multi-stream development coordination
Funding Knowledge Sophistication	Distinguished between "hardship grant" and "innovation fund" • Understanding of crisis-specific versus normal business support • Realistic assessment of funding as "bridge" rather than permanent solution	Nuanced knowledge of resource types • Crisis resource context understanding • Temporal realism about funding duration • Strategic resource utilisation capability

Market Sensing and Performance Recovery	"Sales have just gone crazy" in September • Recognition of seasonal patterns and consumer behaviour changes • Market analysis of cold weather demand surge	Market sensing capability development • Seasonal pattern recognition • Consumer behaviour adaptation understanding • Strategic self-efficacy emergence
Strategic Self-Efficacy Development	Growing confidence in business performance • Enhanced capability development • Confidence in navigating challenges regardless of conditions	Confidence in strategic navigation • Entrepreneurial action sustainability • Key outcome of successful crisis navigation • Permanent capability enhancement
Phase 5: Second Lockdown		
Digital Transformation Validation	Received digital grant that "well-transformed business" • Shifted from B2B hospitality to direct consumer focus • Website redesigned with consumer focus • Professional digital consultant engagement	Business model innovation • Value chain reconfiguration • Crisis-driven experimentation leading to improvement • Accidental business model adaptation
Competitive Positioning Achievement	Website transformed from "basic" to consumer-optimised • Positioned to compete effectively in accelerated digital markets • "Money is being spent online" market participation	Strategic advantages exceeding original adaptation intentions • Competitive advantage creation beyond crisis adaptation • Digital market positioning improvement • Operational complexity management development
Quantified Growth Achievement	Acquired 50 new customers in December, 40 in January • Growth trajectory established during continued crisis conditions • Performance exceeding pre-crisis levels despite early-stage status	Effective market expansion beyond survival • Growth achievement during environmental challenges • Competitive advantages rather than mere survival • Crisis transformation validation

Business Model Reinvention	"Actually growing at this point" • Lost first 7 months but achieved growth through digital focus • "By refocusing on the digital aspect, we are now on a growth trajectory"	Strategic transformation validation • Growth rather than survival achievement • Crisis transformation creating different business • Permanent competitive advantages development
Strategic Transformation Validation	Recognition that crisis period represented fundamental business reinvention • Understanding resource leverage importance • Crisis-period learning created permanent capability enhancement	Extreme conditions enabling reinvention exceeding original potential • Strategic resource acquisition timing importance • Crisis navigation creating enhanced capabilities • Transformation rather than adaptation achievement

Table 5.3 - Summary table of the HGE-4 case study that captures the key information across all five phases, Author 2024

Case five: Potential High-Growth Enterprise five (HGE-5)

A Potential High-Growth Enterprise five was founded in mid-1958 and operates in the construction industry, where their primary activities include the operation of gravel and sand pits; mining of clays and kaolin, and the distribution and manufacture of ready-mixed concrete. They are also involved in the construction of domestic buildings and construction of other civil engineering projects. Company five is medium sized because it employs between 49 and 250 people and represents a mature construction and materials SME that demonstrated strong crisis management capabilities through strategic self-reliance and selective institutional engagement throughout the COVID-19 pandemic. Operating across construction and materials sectors, the HGE-5's response reveals distinctive patterns of autonomous crisis navigation combined with rational resource utilisation that contrast markedly with other SME approaches. Their journey from pre-crisis expansion planning through multiple lockdown cycles illustrates how established SMEs with strong resource positions may navigate extreme uncertainty. This case provides unique insights into how organisational maturity, resource abundance, and sector positioning influence crisis response strategies.

Phase one - Trigger event (March 2020)

Crisis Assessment and Strategic Risk Evaluation

HGE-5 operating within the construction sector, was classified as an essential service and therefore permitted to continue operations during the initial stages of the COVID-19 crisis. Nevertheless, the overall uncertainty at the outset of the pandemic created significant ambiguity regarding appropriate strategic and operational responses. In addition to their core construction activities, HGE-5 engages in the manufacturing and distribution of ready-mixed concrete, which is a segment that was notably disrupted due to the ripple-effects of supply chain instability during the crisis.

As a well-established, medium-sized enterprise with over thirty years of operational history, HGE-5 entered the crisis with stable business processes and a strong financial position,

including healthy cash reserves. These resources played a critical role in mitigating the immediate pressures of the first trigger phase. The ER-5's initial crisis response reveals assessment capabilities that evaluated both immediate vulnerabilities and medium-term sustainability across multiple dimensions, as the evaluation demonstrates crisis evaluation that exceeds simple operational concerns:

"At this moment, we are quite okay as we have a good cash flow and until May we should be alright. The problem is going to be if the government payments are not going to come in May, which is a possibility and another problem is once we will open again, how to pick-up and identifying the damage"

This assessment reveals several cognitive processes that distinguish mature organisational crisis response from reactive entrepreneurial approaches. The phrase *"we are quite okay"* with specific temporal boundaries *"until May"* demonstrates analytical crisis assessment that quantifies survival capability rather than engaging in emotional. The identification of multiple sequential risk factors such as *government payments, reopening challenges, damage assessment* shows risk evaluation that considers both immediate cash flow impacts and systemic market disruption effects.

The ER-5's temporal risk analysis demonstrates an understanding of crisis progression and interdependent vulnerabilities, where the recognition that government payment delays represented existential risk despite strong cash flow indicates understanding of how external dependencies can create vulnerability even for well-resourced enterprises. This analysis suggests strategic thinking that evaluates multiple failure modes rather than focusing on single-point vulnerabilities. The phrase *"identifying the damage"* reveals complex understanding that crisis impact assessment would require methodical evaluation rather than simple operational restart, where this indicates anticipation of complex market changes that would require strategic adaptation rather than simple resumption of previous operations.

Furthermore, the ER-5's analysis of market disruption reveals extended understanding of how crisis conditions cascade through market structures and customer relationships:

"The main issue is going to be orders, and usual customers that we have as they might not be there anymore, or the orders might completely change. So, the work is still going to be there, but there will be a major transition period"

This analysis highlights several layers of strategic evaluation that extend beyond immediate operational concerns, as the recognition that *"usual customers... might not be there anymore"* shows understanding that crisis impact would involve structural market changes rather than temporary demand reduction. This indicates market analysis that considers customer survival probability and sector-specific vulnerability rather than assuming universal recovery, where the distinction between orders changing versus disappearing *"the work is still going to be there, but there will be a major transition period"* reveals understanding of market structure resilience combined with relationship disruption. This potentially suggests that while fundamental demand for construction services would persist, the mechanisms for accessing that demand (customer relationships, ordering patterns, procurement processes) would require possible reconfiguration.

The concept of *"major transition period"* indicates understanding that crisis recovery would involve extended adaptation rather than immediate return to normal operations, where this suggests strategic thinking that prepared for extended uncertainty rather than short-term disruption management, even though this was the first initial few weeks in crisis.

Not uncommonly or surprisingly, the HGE-5's immediate strategic response involved explicit and systematic mode switching from growth to survival that demonstrates strategic flexibility and initial attempts to readapt:

"Our growth strategies have been put on hold now, and we are in a survival mode...Everything is on stop for sometimes until the government will lift the lockdown"

This rapid strategic reorientation demonstrates understanding of crisis requirements and willingness to postpone growth objectives when environmental conditions demand survival focus. This strategic mode switching highlights important enterprise's capabilities, in the

decisiveness of strategy *"put on hold"* rather than optimisation indicates understanding that crisis conditions may require significant strategic reorientation rather than small adjustment.

The timing assessment highlights realistic planning capabilities that balance operational requirements with market constraints and initial adaptation to crisis constraints and understanding that some conditions require comprehensive operational modification rather than efficiency optimisation. The phrase *"everything is on stop"* indicates operational suspension rather than selective activity reduction, suggesting understanding that partial operations might be more costly than complete suspension during extreme uncertainty.

During this period, the HGE-5 began thinking how to reconfigure its business model and adapt operations in response to the evolving crisis where parallel to internal adjustments, EC5 closely monitored government-imposed restrictions and evaluated available support mechanisms to leverage relevant support where applicable:

"We have been getting general updates and information from the government...If I were looking for an industry-specific help, I would go to trade bodies...HIE is able to help with more regional support, but this current situation is not regional, it is global"

The ER-5's sector-specific support preferences reveal in-depth understanding of resource matching to support needs with appropriate institutional capabilities. The recognition that crisis scale "*global*" affects institutional value demonstrates analysis of how crisis characteristics determine appropriate resource sources. The assessment highlights initial strategic thinking about institutional resource allocation and priority setting during crisis conditions. Despite maintaining a relatively optimistic outlook, the firm was compelled to defer the majority of its strategic growth initiatives. Expansion plans and forward-looking projects were effectively suspended, pending greater clarity and stability in the external environment.

Phase two- Reorientation and Crisis Layering (April 2020-June 2020)

Sense-Making and Information Management

The April period associates with managing operational complexity while maintaining clarity about business requirements and regulatory obligations, as the ER-5's description illustrates the multifaceted nature of crisis operations management:

"I am trying to prepare the payroll year-end and get Monday year-end closed because our year-end is on the 31st of March. We took them out of furlough, and now we have put them back in furlough"

This operational description shows crisis management that tries to balance multiple competing requirements simultaneously: regulatory compliance (year-end preparation), workforce management (furlough decisions), operational flexibility, and cash flow optimisation, where the approach to these challenges demonstrates organisational capability for managing complexity under pressure while maintaining compliance with normal business requirements despite abnormal operating conditions.

The HGE-5's workforce management decisions reveal understanding of furlough scheme optimisation combined with operational flexibility requirements, as the movement of employees *"out of furlough"* then *"back in furlough"* demonstrates tactical workforce management that responds to changing operational requirements while trying to maximise government support utilisation. This approach suggests understanding of how to optimise available crisis resources while maintaining operational capability for changing conditions.

The ER-5's assessment of payment challenges shows understanding of systemic crisis impacts that extend beyond individual company control:

"We have got people phoning up looking for payments of stuff that we have got no intention of paying because we are not getting paid for the stuff that we are supposed to get paid for.

It is almost like you put everything on pause...Some people are expecting things to keep ticking along as they should. And other people are sitting there and saying nothing should move until we get the go-ahead, and then we will start again. It is a tricky situation... It is just a question of just trying to manage clients' expectation and trying to minimise the cost to company of trying to do the small volume of work that we are currently doing and that is really it just so that we do not lose too much money doing"

This demonstrates understanding that crisis conditions create systemic payment chain disruptions that require coordinated response strategies, as the phrase *"no intention of paying"* combined with "*not getting paid for the stuff that we are supposed to get paid for*" illustrates understanding of crisis-induced payment chain breakdown that necessitates tactical payment management rather than normal relationship maintenance. The phrase "*put everything on pause*" highlights understanding that crisis conditions may require suspension of normal operations rather than optimisation. This almost enforces strategic patience during crisis conditions rather than attempting to maintain normal rate under abnormal conditions.

The ER-5's detailed description of stakeholder confusion uncovers crisis coordination challenges, that requires stakeholder management across business ecosystem participants. The concluding statement in this quote captures the HGE-5 during a critical period of operational optimisation and strategic damage control, showing approaches to client relationship management and cost optimisation under severely constrained conditions.

What can be seen in this and other phases is HGE-5's systematic approach to cost optimisation through the analysis of crisis economics and operational efficiency under extreme constraints where they are "*trying to minimise the cost to company"* and *"trying to do the small volume of work" ,* where the word "*minimise*" indicates cost adjustment and control that treats every operational activity as cost-benefit decision requiring optimisation rather than simply maintaining operations at reduced scale. The concluding objective "*just so that we do not lose too much money doing*" reveals crisis management approach that accepts controlled losses as strategic objective rather than pursuing profit maximisation/possible opportunities or break-even during extreme uncertainty, where the phrase *"too much money"* indicates evaluation of acceptable loss levels.

The HGE-5's approach to crisis information and funding acquisition demonstrates strategic resource management that optimises funding timing and application strategy:

"The Scottish government has been pretty good at structuring their information on that Ready Scotland site. It is handy to work our way through, so we are just working our way...At the minute, we are still preparing our application for the interest-free loan for the CBILS. We are not needing that right now, so we are waiting until the dust settles and all of the panic applications are done...The furlough money came through, which is great news, and that was one less worry. We got our first furlough money as promised within a week of putting in the application The furlough money came through, which is great news, and that was one less worry. We are getting some new working practices that may be useful when we start going back to work, but nothing concrete"

This approach highlights resource timing strategy that considers both immediate needs and strategic positioning for optimal resource acquisition, as the decision to delay application despite eligibility *"we are not needing that right now"* demonstrates self-assurance in current resource position combined with strategic thinking about optimal resource acquisition timing rather than immediate resource extension.

The phrase *"waiting until the dust settles and all of the panic applications are done"* indicates understanding of crisis resource allocation dynamics and institutional processing capacity, thus showing that resource acquisition timing affects both approval probability and resource terms, especially during the intensified crisis period. Additionally, the success furlough application suggests suitable approach to available resource utilisation, while maintaining strategic patience for more complex funding applications.

The transition to operational development "*we are getting some new working practices that may be useful when we start going back to work*" shows crisis utilisation thinking that extracts strategic value from crisis conditions rather than simply managing crisis survival, as this indicates active experimentation and learning during crisis-imposed operational constraints rather than passive waiting for crisis resolution. The concluding assessment *"but nothing*

concrete" reveals understanding of the difference between experimentation and implementation during crisis conditions, indicating strategic patience that avoids premature operational commitments during uncertain conditions.

Phase three- Route Map Implementation (June 2020-September 2020)

Selective Resource Utilisation and Business Model Review

The third phase period associated with HGE-5's ability to navigate crisis funding systems while maintaining strategic autonomy and resource portfolio diversification. Their description of funding success demonstrates resource utilisation capabilities that balance institutional and autonomous resources strategically:

"We got the Pivotal Resilience support for our modular build through HIE, not spin the bean or anything, but any other support we have had, we managed obviously that has not been through HIE, it has been the government furlough scheme and going through the banks for the support, you know, lend loans"

This statement reveals resource portfolio management that combines institutional funding, government schemes, and commercial resources strategically rather than depending on single resource sources, where the casual tone *"not spin the bean or anything"* suggests that institutional funding was strategically valuable but not critical for business survival, indicating the maintained resource diversification rather than dependence on institutional support. The systematic utilisation of multiple resource streams such as institutional grants, furlough schemes, commercial loans and other sources mentioned, demonstrate crisis resource management that maximises available support while maintaining strategic independence.

The ER-5's assessment of funding processes shows understanding in institutional navigation capabilities combined with realistic expectation management, necessary during the crisis period:

"I think the Pivotal Resilience actually was quite a simple process. Obviously, we did not get everything we asked for, but I think we asked for a hundred thousand, we got thirty thousand, but you cannot give it to everybody and not everybody can get what they asked for, so I thought the process was pretty straightforward and the decision was pretty quick"

The realistic assessment of funding limitations shows understanding of institutional constraints and resource scarcity rather than disappointment about partial funding, where this mature perspective enables continued institutional engagement without unrealistic expectations or emotional reaction to resource limitations. Furthermore, the ER-5's approach to funding outcome assessment shows resource evaluation that considers both absolute and relative value, since receiving thirty thousand of a requested hundred thousand is evaluated positively because the process was efficient, and the decision criteria were reasonable rather than negatively because the full amount was not received.

This third phase is further associated with attempted operation readaptation and navigating crisis constrained environment, where the ER-5's description of operational adaptation highlights business model resilience that enabled continued operations under modified conditions through selective activity management:

"Very slowly going back, there are two distinct aspects to our business. One is construction work, which is generally off-site if you like it. The other is materials, which is waste disposal on quality products, which is on-site delivering services to construction sites. So, there has been two different challenges. The construction site has been pretty simple actually. Everybody has been furloughed, and it has just been trying to manage outgoings to incomings, which has been difficult, and the material side had the added complication of having to service a tiny volume of essential supply-demand on trying to do it in a way that we did not lose money or too much money, which has been challenging... The restarting that is going to be tricky"

This analysis shows enterprise's understanding of business model structure enabled crisis response across different operational components, where the evaluation of business model components allowed for organisational capability to separate business operations to enable selective continuation, thus making them more resistant and agile to the crisis impact. The strategic approach to operational restart demonstrates detailed understanding of sector-specific recovery patterns and customer behaviour:

"Because the construction is generally - the start-up construction is the driver because none of our construction was essential, we were basically all furloughed, so, construction-wise, we will be doing nothing but because there are materials say it is due service some essential project or where services some essential project, they have been just ticking along in the box then"

This operational strategy reveals understanding of how crisis restrictions affect different business activities and the strategic value of maintaining operational capability in available areas while suspending operations in restricted areas. The maintenance of materials operations while suspending construction demonstrates strategic operational flexibility that preserves customer relationships and market presence while optimising resource utilisation during the time of uncertainty.

Additionally, this approach demonstrates attempts at operational optimisation that balances multiple objectives simultaneously such as regulatory compliance with lockdown restrictions, cost minimisation through furlough utilisation, revenue preservation through essential service provision, and operational capability maintenance for recovery positioning. The phrase *"trying to do it in a way that we did not lose money or too much money"* shows practical optimisation that accepts losses while minimising their magnitude. This is where the differentiated approach to business unit management such as complete furlough for construction and selective operations for materials, indicates operational strategy that optimises across different business activities based on their crisis characteristics and opportunities rather than applying uniform operational approaches.

Despite the fact that this phase was typically associated with the partial reopen of some area and people generally got slightly more freedom to move around, this is how ER-5 describes this phase:

"In Scotland, they basically have said, 'We can start planning in Covid phase one, and we can start planning', then they said they may move to a soft start, which in truth is very little help, because the soft start says that you cannot do any kind of any work, which might involve the need for PPE. So, it is easier to leave the staff at home and the overheads have taken them out for the little bits of work we have will never be covered. So, it is easier if we do it ourselves and stretch ourselves to a breaking point before we have to take care of anybody that is going to cost us money"

This captures HGE-5 during a crucial period of regulatory interpretation and operational strategy development, that shows analysis of government policy implementation and its practical business implications. The statement highlights operational decision-making that weighs regulatory compliance against economic viability while managing workforce and cost optimisation under constrained conditions. The phrase *"in truth is very little help"* demonstrates assessment of policy effectiveness based on practical business requirements rather than theoretical compliance capability, that suggest policy analysis that evaluates regulatory interventions rather than simply regulatory compliance feasibility.

Additionally, the specific identification of PPE requirements as operational constraint demonstrates understanding of construction industry operational requirements and how regulatory constraints interact with industry-specific work practices. The ER-5's strategic response or ultimately decision shows thinking about resource optimisation that balances workforce costs against personal capacity limits "*it is easier if we do it ourselves*" and "*stretch ourselves to a breaking point*", where this decision demonstrates resource optimisation under extreme constraints that prioritises variable cost elimination over operational efficiency or personal sustainability, with willingness to accept personal operational stress to adjust cost structure during uncertain conditions.

Phase four- Stabilisation Period (September 2020 - January 2021)

Operational and Strategic Development

This forth phase is again associated with information acquisition and sense-making that is driven by information management and strategic intelligence gathering, highlighting approaches to crisis information processing and multi-source integration. This is what ER-5 shared in autumn months:

"I had taken paying close attention to the government's arrangements in terms of the job retention scheme, the business attraction loan scheme, and all these kinds of things. So, I was paying close attention to what was on offer. We are also members of the Civil Engineering Contractors Association, and they would pass me daily bulletins on things. And we sort of getting weekly updates from them"

This highlights precise crisis-related information management that goes beyond simple government update monitoring to obtain comprehensive industry intelligence systems and government policy monitoring that again, goes beyond passive information reception to active gathering and analysis of the surrounding environment. The phrase "*paying close attention*" indicates deliberate, systematic information processing rather than casual awareness or reactive information consumption. This further suggests proactive information management that treats government policy as strategic intelligence requiring systematic analysis rather than reactive information consumption when specific needs arise.

The overall decision-making illustrated in this phase demonstrates crisis management approach that prioritises survival over efficiency, growth, or operational optimisation. The systematic evaluation of regulatory constraints, cost structures, and operational alternatives shows complex crisis management capabilities that are aimed at informed decision-making under extreme uncertainty. The following quote captures the HGE-5 during a period of strategic uncertainty and operational decision-making under extreme temporal pressure, while challenging questions about business viability and workforce sustainability:

"I suppose the ongoing challenge is just the uncertainty. That is the problem. I can understand that we cannot get certainty because they are [the Government] *just watching for the numbers... financial support is going to be the issue until we figure out what the hell does the viable business look like. We have got to figure that out by September because we cannot afford to be paying five percent or ten percent of furlough for people that do not look like they are going to justify the position after it, so there is going to have to be a night of the long knives"*

The ER-5's identification of uncertainty as the primary challenge demonstrates crisis cognition that distinguishes between manageable operational problems and overall strategic uncertainty, where the word *"ongoing"* indicates understanding that uncertainty represents a persistent condition requiring systematic management rather than a temporary problem requiring immediate solution. Furthermore, the characterisation of uncertainty as *"the problem"* reveals understanding that uncertainty itself, rather than specific operational challenges or resource constraints, represents the fundamental management challenge during crisis conditions.

The ER-5's analysis of uncertainty sources shows understanding of various factors affecting business planning capability, as the phrase *"I can understand"* accepts uncertainty and recognition that external authorities are "*watching for the numbers"* shows understanding of how data-driven (Covid-19 related numbers) and decision-making by external stakeholders (e.g. the Government) affects overall business planning capability minimising viable options. This demonstrates analytical thinking that considers decision-making processes and information requirements rather than simply reacting to policy outcomes.

The specific decision deadlines highlights understanding of how external constraints create temporal pressure for strategic decision-making *"figure that out by September"* that integrates external policy changes with internal strategic decision-making requirements, affecting potential organisational survival and strategic development. The detailed understanding of furlough cost implications *"cannot afford to be paying five percent or ten percent of furlough"* reveals financial analysis that considers policy implementation details and their cost structure implications rather than simply general awareness of policy changes.

Additionally, the approach to workforce evaluation highlights strategic thinking that treats personnel decisions as strategic investments requiring justification based on future enterprise requirements, where the future-oriented assessment criteria show understanding that crisis conditions may require workforce optimisation based on post-crisis organisational requirements.

Despite the continuous uncertainty, the sense-making process was prominent in this phase yet again, where the HGE-5 was scanning the environment in order to make a decision regarding the enterprise's position, where the below quote captures a pivotal period of strategic restructuring contemplation and recovery planning, highlighting approaches to organisational transformation planning and external resource utilisation for strategic development:

"We are discussing something about a restructure just now. Nothing has been decided, nothing has been agreed, nothing has been implemented, but they [HIE] *can offer some guidance or support, both in terms of the fundamentals in terms of how the to restructure would look like and some advisory in terms of the generation of that restructuring plan. I suppose maybe even some wider support in terms of implementation thereafter. I have some contact with them all, but I just have not gotten to that stage yet... The vaccine is coming now and although I know I have been shut for a while because of the coronavirus situation, I think last night we are back on the cards again"*

The statement demonstrates advanced strategic thinking that balances restructuring necessity with implementation timing while managing multiple strategic variables simultaneously, where the phrase *"discussing something about a restructure"* indicates early-stage strategic evaluation that treats restructuring as planning process rather than crisis reaction or immediate operational necessity. The present tense *"just now"* indicates active strategic evaluation occurring during the interview period, suggesting the HGE-5 was evaluating restructuring options while maintaining current operations rather than delaying strategic planning until crisis resolution.

The detailed categorisation of different support types such as "*guidance*", "*support*" or "*advisory"* demonstrates methodical thinking that evaluates external resources based on specific capability requirements rather than general assistance availability, where this suggests understanding of restructuring process complexity and resource matching requirements. Lastly, the vaccine reference as recovery catalyst demonstrates understanding of how external developments affect market conditions and strategic positioning requirements, as this shows analytical thinking that connects broad environmental changes with specific business positioning opportunities. The phrase "*back on the cards again"* suggests understanding that restructuring activities had been suspended during peak crisis but were becoming viable again as recovery conditions started to emerge slowly.

Overall, what can be seen in this phase, is HGE-5's systematic approach to information acquisition and planning on restructuring timing, that demonstrates strategic patience that balances preparation requirements with opportunity scanning. The recognition of changing environmental conditions *"vaccine is coming"* as strategic timing factors demonstrates environmental analysis that influences strategic initiative timing rather than pursuing predetermined strategic plans regardless of external conditions. The detailed evaluation of restructuring support requirements shows understanding of organisational transformation complexity that requires multiple types of external expertise and support across different phases.

Phase five- Second Lockdown (January 2021 - March 2021)

Enterprise Capability Assessment and Crisis Response Acknowledgement

Most of the discussion in this final phase was associated with retrospective analysis of crisis adaptation learning and sector-specific advantages, discussing developed crisis management thinking that integrates operational learning with strategic positioning assessment while demonstrating mature evaluation of government policy effectiveness. Given that during this stage Scotland entered second national lockdown, despite previously discussed positive attempts at controlling the Covid-19 infection rate, this is what ER-5 shares:

"We were certainly having issues, the bottom line is all of the infrastructure that we needed in order to do remote work, it was all in place the first time around so we had a lot of IT investment with a lot of IT hours and trying to get all of these systems into a place where people could work from home and so we did not have to do that this time, the second time. But also for us, the big benefit for us, is being in construction our workload has been really unaffected. We have been keeping all our IT working pretty much all the time. Yeah, so that is the massive"

The ER-5's reflection on IT infrastructure development indicates understanding of how crisis-driven investments create lasting capabilities that can be essential for the survival, where the phrase "*we were certainly having issues*" demonstrates honest acknowledgment of initial crisis adaptation challenges rather than claiming immediate adaptation success. Consequently, this enables effective learning extraction from crisis. The description of infrastructure development "*a lot of IT investment with a lot of IT hours*" indicated understanding that crisis adaptation required substantial resource commitment and organised capability development rather than simple operational adjustment. This demonstrates resource allocation capabilities that treat crisis adaptation as strategic investment rather than emergency expense.

The HGE-5's assessment of second lockdown preparation demonstrates crisis learning integration from the first lockdown and overall crisis impact *"so we did not have to do that this time, the second time"* as this statement highlights understanding of how crisis-driven capability development creates lasting organisational advantages that reduce future crisis adaptation costs and complexity. Furthermore, this shows organisational development that extracts lasting value from crisis investment rather than treating crisis adaptations as temporary measures.

The analysis of construction sector characteristics reveals understanding of how industry-specific factors affect crisis impact and recovery potential, where the phrase "*big benefit for us*" demonstrates analytical assessment of sector-specific advantages, showing causal analysis that recognises structural factors affecting crisis outcomes beyond organisational control. The recognition that construction workload remained "*really unaffected*" indicates

understanding that sector characteristics determined crisis impact more than organisational responses or adaptation strategies, where this distinguishes between controllable and uncontrollable factors affecting crisis outcomes.

Given that Scotland entered the second lockdown, the ER-5 shared the retrospective learning that took place in the first lockdown:

"I think one of the mistakes that we made in the first lockdown is that construction by its nature, it is outside. Generally, it is people are usually pretty well distance anyway because you usually operate heavy machine, we could have been back at work within four weeks. We would not have significantly added to the risk profile of the virus, but they kept aside for few months and another I thought was probably a mistake but hard to be critical when nobody has ever been through it before"

This offers important insight into how HGE-5 made sense of the early stages of the Covid-19 crisis. This quote demonstrates retrospective sensemaking (Weick, 1995), as the ER-5 looks back and reassesses earlier decisions using new knowledge gained from experience. Given the newly gained knowledge and experience, they believe that returning to work sooner would have been possible and safe, based on the nature of their industry. This kind of reflection shows how enterprises try to learn from past events and reshape their understanding of what happened, thus improving their decision-making capabilities.

In addition, there is evidence of resilience and learning, as ER-5 saying, "*hard to be critical when nobody has ever been through it before",* suggesting emotional maturity and a desire to move forward, that highlight resilient capabilities developed during the intense crisis period. Notably, the ER-5 is not discouraged for the lack of a plan but rather recognising that they now see new possibilities that were not clear at the time.

Furthermore, their reflection on crisis learning highlights understanding of crisis response capability development that challenges conventional planning approaches:

"I think everybody saying perspective would have changed. The biggest thing I see all this resilience planning that put to do that is a good thing and all of that did not dealt with a pandemic. So, it was actually pointless when it came right back down to it, it would have been helpful in more minor issues but when it came to pandemic we just react like we would normally react. And I suppose the key is the ability to react. We had to make some people go, we had to change our working practice, we had to invest in more IT, and we had to do that very quickly. And we did that, it was at the moment decision. There was not the ability to plan or do all the things that they tell you as businesses you should do. And that has come to how it works"

The above assessment demonstrates interpretation that crisis response largely depends on organisational capabilities and characteristics rather than formal planning processes or dedicated crisis procedures. The recognition that "*we just react like we would normally react*" highlights understanding that crisis response effectiveness depends on organisational culture, decision-making capabilities, and resource management rather than crisis-specific preparation. The distinction between crisis planning for "*minor issues*" versus "*pandemic*" points to understanding of how crisis scale affects planning effectiveness and response requirements, as this analysis suggests that extreme crises require organisational capabilities rather than procedural responses.

In other words, this demonstrates renewed understanding that planning effectiveness varies with crisis scale and that extreme events may require fundamentally different response approaches than planned crisis responses. Where the emphasis on "*ability to react*" rather than ability to plan or predict demonstrates understanding that organisational effectiveness under extreme uncertainty depends on adaptive capability rather than predictive accuracy or comprehensive planning.

Additionally, this quote highlights rapid decision-making under pressure and overall assessment of enterprise adaptation requirements, where ER-5 states "*we had to make some people go, we had to change our working practice, we had to invest in more IT, and we had to do that very quickly*", pointing to the nature of required adaptations rather than isolated operational adjustments. The comprehensive scope of adaptations such as workforce

reduction, operational changes, technology investment etc, demonstrates understanding that crisis response required significant organisational adjustments across multiple operational dimensions rather than incremental adjustments to existing practices. The emphasis on "*very quickly*" highlights that crisis conditions created time pressures that superseded normal decision-making and implementation processes, indicating understanding that crisis effectiveness depends on execution speed rather than decision optimisation or comprehensive analysis.

The ER-5's reflection on decision-making processes highlight understanding of how extreme conditions affect the decision-making abilities, where it is mentioned that *"and we did that, it was at the moment decision...there was not the ability to plan or do all the things that they tell you as businesses you should do",* as this indicates recognition that crisis conditions required immediate decision-making without a possibility for extensive analysis or planning processes and that crisis conditions may eliminate normal planning processes and established decision-making framework. This shows organisational analysis that recognises how environmental constraints affect internal decision-making capabilities. Additionally, the reference to business advice *"all the things that they tell you as businesses you should do"* points to evaluation of formal business management agendas against actual crisis experience, showing capability for independent evaluation of management principles based on practical experience.

The ER-5's analysis of crisis success factors points to understanding of how organisational characteristics and sector positioning influence crisis outcomes:

"Our saving grace is that the demand for our services broadly has remained the same. Businesses that do tourism industry, hospitality industry and the events industry, it does not matter how good they are at targeting, if they do not have a demand for their services they are in trouble. And that is not a reflection of them being poorer business than me, that is just pure blind luck. As long as the customer is there then a good businessperson will manage to survive. And also, I am in a good sector, I am a lucky guy. Because construction is such an influence on the economy, construction is a well-supported sector in terms of trying to get up and running again, and that has been the key for us. We have still got the demand, so yes,

we had unbelievable bumps in the road. But actually, in many ways, we have used it to our advantage, and we are definitely now performing better than we were before. We have lost a lot from the organisation and we are still opening fine with everybody who has come back now seems a little bit more appreciative of the job and the fragility of jobs"

This assessment demonstrates understanding that crisis outcomes often depend on sector characteristics and external factors rather than management quality or organisational capability, avoiding attribution errors while maintaining confidence in organisational capabilities. The recognition that sector demand characteristics determined crisis impact more than management capability demonstrates analysis that considers structural factors rather than attributing outcomes primarily to organisational capabilities. Hence why, the HGE-5 was seeking for external support and financial contributions throughout the duration of this crisis.

The analysis of construction sector economic importance *"such an influence on the economy"* shows understanding of how industry characteristics affect government policy priorities and support allocation during crisis recovery, where this demonstrates thinking that considers broader economic relationships affecting sector-specific crisis experiences. Lastly, the recognition of workforce reduction "*lost a lot from the organisation*" combined with improved performance points to understanding that organisational effectiveness may not depend entirely on workforce size but on workforce engagement and capability utilisation, especially given the challenging crisis induced environmental turbulence.

This case illustrates how crisis prompted the HGE-5 to think critically about past decisions, reframe their understanding of risk, and consider how they might act differently if faced with similar uncertainty again. It also shows how sensemaking, resilience, and flexible thinking are key to navigating crisis in small and medium business contexts. The systematic integration of crisis experience with performance improvement demonstrates organisational learning that extracts strategic value from crisis experience rather than simply recovering from crisis damage. Additionally, this case demonstrates strategic thinking that recognises the role of external positioning, market characteristics, and structural advantages in determining crisis outcomes and management contribution to successful crisis navigation.

In conclusion, the *High Growth Enterprise five* demonstrates that organisational maturity, strategic resource allocation along with calculated steering enabled different crisis navigation approaches that prioritise autonomy over collaboration, strategic patience over immediate action, and methodical evaluation over reactive response. Overall crisis management approach was characterised by maintained strategic clarity under extreme uncertainty with continuous evaluation of crisis risks, temporal constraints, and resource requirements that enabled informed decision-making that balanced multiple objectives simultaneously while maintaining strategic coherence. This analytical approach enabled strategic decisions across multiple time horizons rather than simply reactive response to immediate pressures. The willingness to accept controlled losses while maintaining strategic assets shows capabilities in resource allocation that treats crisis periods as strategic investment in long-term capability preservation rather than simple cost minimisation.

Characteristics	Key Events & HG5 Enterprises' Responses	Theoretical and Organisational Insights
Phase 1: Trigger Event		
Crisis Assessment and Strategic Risk Evaluation	WHO pandemic declaration and UK lockdown • Essential service classification enabling continued operations • Assessed "quite okay" with good cash flow until May • Identified government payment delays and reopening challenges as key risks	Analytical crisis assessment quantifying survival capability • Risk evaluation considering sequential factors • Temporal risk analysis understanding crisis progression • Strategic thinking evaluating multiple failure modes
Market Disruption Analysis	Recognition that "usual customers might not be there anymore" • Understanding that work would remain but require "major transition period" • Structural market changes rather than temporary demand reduction	Market structure resilience analysis • Customer survival probability assessment • Sector-specific vulnerability recognition • Extended understanding of cascade effects
Strategic Mode Switching	Growth strategies "put on hold" • Explicit switch to "survival mode" • All expansion plans suspended until government lifts lockdown	Strategic flexibility demonstration • Decisive strategic reorientation • Understanding crisis requirements • Resource reallocation from growth to survival
Support System Evaluation	Government updates monitoring • Trade body consultation for industry-specific help • Recognition that crisis scale affects institutional value • HIE regional support inappropriate for global crisis	Strategic thinking about institutional resource allocation • Crisis scale analysis determining appropriate support sources • Resource matching to support needs • Institutional capability evaluation
Phase 2: Reorientation and Crisis Layering		

Operational Complexity Management	Preparing payroll year-end whilst managing furlough decisions • Moving employees out of and back into furlough • Balancing regulatory compliance with operational flexibility	Crisis management balancing multiple competing requirements • Organisational capability for complexity under pressure • Tactical workforce management optimisation • Crisis resource utilisation understanding
Systemic Payment Chain Analysis	Understanding crisis-induced payment chain breakdown • Strategic approach: "no intention of paying because we are not getting paid" • Recognition of stakeholder confusion requiring coordination	Understanding systemic crisis impacts beyond individual control • Strategic payment management versus relationship maintenance • Crisis coordination challenges across ecosystem participants
Strategic Resource Timing	Delaying CBILS application despite eligibility • "Waiting until the dust settles and all panic applications are done" • Strategic patience for optimal resource acquisition timing	Resource timing strategy considering approval probability • Understanding crisis resource allocation dynamics • Strategic thinking about institutional processing capacity
Cost Optimisation Under Constraints	"Trying to minimise cost to company" • Accepting controlled losses as strategic objective • Client expectation management during reduced operations	Crisis economics understanding • Operational efficiency under extreme constraints • Strategic damage control approach • Controlled loss acceptance
Phase 3: Route Map Implementation		
Selective Resource Utilisation	Received £30,000 of requested £100,000 Pivotal Resilience funding • Combined institutional grants, furlough schemes, and	Resource portfolio management • Strategic independence maintenance • Mature perspective on institutional constraints • Resource diversification strategy

	commercial loans • "Not spin the bean" - funding valuable but not critical	
Business Model Component Analysis	Separated construction (off-site) and materials (on-site) operations • Different crisis challenges for each component • Selective continuation of materials whilst suspending construction	Understanding business model structure enabling crisis response • Strategic operational flexibility • Component-based crisis management • Selective activity management
Regulatory Interpretation and Compliance	Analysis of Scottish government phases • Recognition that "soft start" provided "very little help" • PPE requirements affecting operational viability • Personal capacity extension to avoid workforce costs	Policy effectiveness assessment based on practical requirements • Regulatory constraint interaction with industry practices • Resource optimisation under extreme constraints • Strategic workforce cost elimination
Strategic Operational Flexibility	Maintained materials operations for essential projects • Complete furlough for construction activities • "Stretch ourselves to breaking point" before taking on staff costs	Strategic value of maintaining operational capability • Operational strategy optimisation across business activities • Crisis characteristics-based decision making • Resource utilisation optimisation
Phase 4: Stabilisation Period		
Comprehensive Information Management	"Paying close attention" to government arrangements • Daily bulletins from Civil Engineering Contractors Association • Weekly updates and systematic analysis	Proactive information management • Government policy as strategic intelligence • Systematic analysis versus reactive consumption • Industry intelligence systems development

Strategic Uncertainty Management	Uncertainty identified as primary challenge • Understanding external data-driven decision-making affects planning • September deadline for workforce decisions due to furlough costs	Crisis cognition distinguishing operational from strategic uncertainty • Understanding persistent uncertainty requiring systematic management • Temporal pressure for strategic decision-making integration
Restructuring Evaluation	Discussing restructuring options with HIE support • Evaluating guidance, advisory, and implementation support • Vaccine development as recovery catalyst affecting strategic timing	Advanced strategic thinking balancing transformation with timing • Methodical external resource evaluation • Environmental analysis influencing strategic initiative timing
Future-Oriented Workforce Assessment	"Night of the long knives" - workforce evaluation based on post-crisis requirements • 5-10% furlough cost implications analysis • Strategic investment justification for personnel decisions	Strategic thinking treating personnel as investments • Future-oriented assessment criteria • Policy implementation detail consideration • Workforce optimisation based on post-crisis needs
Phase 5: Second Lockdown		
Crisis Learning Integration	IT infrastructure already in place for second lockdown • "We did not have to do that this time" • Construction workload remained "really unaffected"	Crisis-driven capability development creating lasting advantages • Crisis learning integration • Understanding sector characteristics determining impact
Retrospective Crisis Analysis	Recognition that construction could have resumed within 4 weeks of first lockdown • "Hard to be critical when nobody has ever been through it before" • Industry nature (outdoor, naturally distanced) provided safety advantages	Retrospective sense-making • Learning extraction from crisis experience • Emotional maturity and forward-looking resilience • Industry-specific advantage recognition

Crisis Response Capability Assessment	"We just react like we would normally react" • Resilience planning "pointless" for pandemic scale • Emphasis on "ability to react" rather than plan	Understanding crisis response depending on organisational capabilities • Crisis scale affecting planning effectiveness • Adaptive capability versus predictive accuracy • Organisational culture importance
Rapid Organisational Adaptation	Workforce reduction, working practice changes, IT investment "very quickly" • "At the moment decisions" without extensive planning • Comprehensive adaptation across multiple dimensions	Rapid decision-making under pressure • Crisis conditions eliminating normal planning processes • Execution speed versus decision optimisation • Environmental constraints affecting decision-making
Sector Advantage Recognition	"Our saving grace is that demand for services broadly remained the same" • Construction sector economic importance • "Pure blind luck" versus management capability • Performance improvement despite workforce reduction	Understanding crisis outcomes depending on structural factors • Sector characteristics versus management quality • Economic importance affecting government support • Strategic value extraction from crisis experience

Table 5.4 - Summary table of the HGE-5 case study that captures the key information across all five phases, Author 2024

Case six: Potential High-Growth Enterprise six (HGE-6)

A Potential High-Growth Enterprise six was founded in 2004 and operates in the food production sector and is medium-sized as it employs between 49 and 250 people. Their primary activities include processing and preserving fish, crustaceans and molluscs, the production process takes place in a factory, where the ready product is further distributed to large chain supermarkets. HGE-6 represents a case of a food production SME that demonstrated crisis management capabilities through operational resilience, strategic opportunity scanning, and systematic risk mitigation throughout the COVID-19 pandemic. Unlike other cases that faced demand collapse, this enterprise experienced surge demand due to its position in the essential food supply chain.

Their crisis management approach shows patterns of opportunity recognition, operational adaptation, and conservative strategic decision-making that enabled not just survival but performance enhancement during extreme uncertainty. These longitudinal findings show how sector-specific positioning altered crisis management requirements, enabling strategic approaches that pursued growth opportunities while systematically managing operational constraints and strategic risks across multiple crisis phases.

Phase one - Trigger event (March 2020)

Crisis Assessment and Scenario Planning

The HGE-6 was considered an essential business because it operated in the food production sector, so as a result, it was allowed to continue its operations during the Covid-19 pandemic. However, when government restrictions were introduced, the enterprise had to reassess its operations and make necessary adjustments. During this first initial crisis phase, HGE-6 responded by engaging in scenario planning that involved preparing for different possible outcomes, ensuring that they could remain open while complying with government rules. Their focus at this stage was to identify and implement guidelines that would protect the safety of the production site and its workers, anticipating and acknowledging potential crisis development rather than reacting to crisis impact:

"In the last three, four weeks, we have been working on scenario planning, because of the virus breakout. We are in the food production sector, so our order went through the roof, which was quite good, but our workers have started to self-isolate, and this creates a big issue"

The phrase "*scenario planning*" indicates strategic analysis that employed formal planning procedures rather than intuitive crisis response, where this indicates enterprise's capability for structured strategic analysis under uncertainty that enabled proactive preparation rather than reactive crisis management. The *three-to-four-week* timeframe suggests they had been monitoring crisis development and conducting strategic analysis in the first instances of crisis development to minimise the impact as much as possible and where possible. This approach shows strategic capabilities that enabled environmental scanning and strategic preparation during crisis emergence.

Additionally, the phrase "*order went through the roof*" indicates not merely increased demand but surge demand that exceeded normal operational capacity, where this recognition highlights market analysis capabilities that noted sector-specific crisis effects from economic disruption patterns affecting other industries. An understanding that workforce self-isolation represented significant operational constraint rather than temporary inconvenience indicates operational understanding about production system vulnerabilities and capacity requirements. This analytical capability enabled immediate strategic planning that addressed constraint management in managing crisis survival.

Despite favourable market conditions that were unique to this particular case, the ER-6 shared their inevitable delay to pre-crisis established growth plans:

"Currently, all our growth plans have been put on hold, and all we are trying to do is keep going using all our resources as much as possible"

This strategic decision points to crisis management approach that prioritised strengthening and utilisation of available resources over expansion, despite positive market signals. The suspension of growth plans during favourable market conditions demonstrates analytical capabilities that understood operational constraint management, where the phrase "*using all our resources as much as possible*" indicates resource optimisation that focused on capacity utilisation rather than capacity expansion during uncertainty. Furthermore, this shows an understanding that premature growth pursuit might compromise long-term strategic positioning despite short-term market advantages, given the uncertainty surrounding this crisis.

Similar to other enterprises, the HGE-6 started identifying different sources of funding opportunities, by utilising their previously established networks:

"In case the majority of our workers will go off, we might need HIE's help to support and find an available workforce through their channels. We have a good skill set to cope with everything that is happening right now, but in case things go drastically wrong, we might need them. The main thing for us is funding and HIE is not offering any at this point"

The statement demonstrates crisis management and sense-making thinking that balances current capability analysis with future scenario preparation while maintaining realistic assessment of institutional resource availability. The first sentence points to contingency planning that anticipated potential workforce unavailability scenarios due to the crisis impact and identified specific institutional resource solutions that could also be potentially acquired. The phrase "*majority of our workers will go off*" quantifies potential workforce disruption levels (e.g. very high) rather than simply acknowledging general workforce risk. In this case, the workforce contingency planning shows operational risk assessment that understood the cascading effects of pandemic conditions on labour availability as worker's self-isolation could reach critical mass levels.

The identification of institutional workforce support capabilities "*find an available workforce through their channels*" highlights an understanding of institutional resource availability,

showing how institutional networks could provide access to alternative labour sources during crisis conditions when normal recruitment channels might be compromised. The ER-6's assessment of resource evaluation, where the phrase "*good skill set to cope with everything that is happening right now*" points to confident evaluation of their current capabilities while maintaining understanding about temporal and conditional limitations. That distinguished between current adequacy and potential future requirements under changing crisis conditions, as this evaluates existing resources against current crisis requirements.

The framing *"but in case"* demonstrates scenario thinking and planning that maintained confidence in current capabilities while preparing for potential requirement escalation, where the phrase "*drastically wrong*" indicates understanding that crisis conditions could evolve beyond current planning and organisational capacity, showing realistic assessment of uncertainty and potential requirement change. Lastly, the phrase "*main thing for us is funding*" demonstrates strategic prioritisation that identified financial resources as the primary constraint limiting strategic option availability, thus HGE-6 would be constantly (throughout the five crisis phases) scanning for potential funding opportunities released during this crisis.

Phase two- Reorientation and Crisis Layering (April 2020-June 2020)

Workforce Management and Crisis-Driven Expansion Reconfiguration

The HGE-6's took a structured approach to identifying opportunities during the crisis. This shows a more advanced level of strategic thinking, where initial caution was replaced by a willingness to grow the business once there was enough evidence from the market to support that decision:

"So we're actually quite in a fortunate position that because we supply to Supermarket and our sales volumes has actually gone up and run a good position. So, we have approached HIE to see if we can get some funding support to help grow the business and open up a new production unit"

The phrase "*quite in a fortunate position*" shows the HGE-6's ability to analyse their situation clearly, understanding that their business benefited from specific sector-related advantages during the crisis. Instead of assuming their success was due to management competencies or strategy, this demonstrates a more nuanced understanding that differentiates between controllable internal factors and external conditions, while still expressing confidence in the capacity to take advantage of favourable circumstances.

Their approach to growth "*approached HIE to see if we can get some funding support*" illustrates a proactive and strategic response to crisis-induced demand. They used the rising demand caused by the crisis as evidence to support investment decisions they had previously put on hold. This evidences a flexible strategic orientation, where investment timing was adjusted to fit emerging external realities rather than being driven by pre-established schedules. Their focus on "*open up a new production unit*" also suggests an understanding of the difference between scaling operations and merely optimising existing processes. Recognising that demand surges required expansion in production capacity, they exhibited an ability to align resource utilisation with strategic growth objectives.

The HGE-6's structured evaluation of its available resources reflects strong project planning capabilities that supported a quick and informed response to emerging market opportunities, where ER-6 shared their future expansion plans, based on previous investments and newly appeared opportunities:

"*We have a building which we bought already. And we think it's going to cost about £1.2 million to develop it and get it to fit state. But by doing that's going to create another 20 jobs, and we have half the money ourselves already. So, we were looking at some grant support from HIE to help us get it over the line*"

The first statement highlights how earlier investment in strategic assets allowed this enterprise to remain flexible and prepared for potential expansion, even before the crisis created clear signs of increased demand, where this indicates forward-thinking and proactive

decision-making. The specific financial projection of *"£1.2 million to develop it and get it to fit state*", along with the intention to "*create another 20 jobs*", shows careful planning that considered both the financial and operational implications of expansion. It also reflects an awareness of the broader economic impact, suggesting that the HGE-6 was not only concerned with internal growth but also with job creation and regional contribution around Scottish Highlands. Finally, the comment "*we have half the money ourselves already*" illustrates prudent financial management and a strong resource position, whereby maintaining access to capital despite the crisis context preserved the ability to act quickly when the opportunity arose. This suggests a strategic approach to resource allocation that balanced the need for stability with the readiness to scale when the time was right.

Furthermore, during this phase, the ER-6 shared a key moment where the enterprise was reassessing their strategy in response to the ongoing crisis. It shows a careful and strategic approach to crisis management that aimed to maintain growth ambitions while being realistic about the wider economic challenges:

"We are still looking to grow the company, but we're very mindful of the economic impact of Covid-19 and I guess it's more, we don't know of any countries when it comes out of lockdown...We will be operating this way for at least another six months in terms of social distancing measures in the factory and what not...But at the same time, we've put all unnecessary capital expenditure on hold for six months"

The first statement illustrates a careful balance between forward-looking goals and awareness of external constraints, where the phrase "*still looking to grow*" signals the determination to stay focused on long-term objectives, even during a period of disruption. This highlights a growth mindset that persisted despite the uncertainty. At the same time, the use of the word "*but*", followed by "*very mindful of the economic impact*", indicates a cautious and reflective attitude, where they clearly considered the broader economic environment, rather than focusing only on their business or sector.

This balance between ambition and caution suggests an approach to crisis management that was both strategic and grounded, as at this point it allowed the enterprise to continue developing without taking on unnecessary risks. It also reflects a realistic understanding of the limitations imposed by the external environment, avoiding overinvestment or overly optimistic decision-making.

Later in the same reflection, the ER-6 says, "*and I guess it's more, we don't know of any countries when it comes out of lockdown*", where this shows awareness that the crisis's global impact, highlighting uncertainty not just about their own situation, but about the wider international landscape. The phrase "*we don't know of any countries*" demonstrates an attempt to track and analyse recovery trends at a global level, in order to obtain information on how to proceed, see 'best practice' from other organisations and their crisis recovery strategy. This approach supported more flexible and adaptable planning, based on changing conditions rather than rigid assumptions.

The comment *"we will be operating this way for at least another six"* reflects a clear and structured approach to operational planning, where this shows an ability to think across different timeframes such as managing short-term restrictions while still planning ahead. The mention of "*at least another six months*" indicates that the business was not treating the changes as temporary disruptions but instead was planning for them to last over an extended period. By saying "*operating this way*," there is willingness to accept that new working methods or new norms brough on by a crisis, that suggests a shift from crisis response to integration, where operational changes were being embedded into the broader planning rather than being seen as temporary measures to be quickly reversed.

At the same period, the ER-6 explains, "*but at the same time, we've put all unnecessary capital expenditure on hold for six months*", where this reveals a strategic approach to financial decision-making during uncertain times, as the phrase "*all unnecessary capital expenditure*" shows the carefully reviewed and categorised spending analysis, choosing to pause only non-essential investments. The characterisation as "*on hold*" rather than "cancelled" indicates strategic thinking that preserved future investment options while managing current resource constraints. This approach enabled resource flexibility that could respond to changing conditions while maintaining current operational adequacy and strategic positioning.

ER-6's systematic analysis of operational challenges demonstrates sophisticated crisis management that integrated opportunity pursuit with constraint management:

"Before this time last year, we were thinking about how we can grow the turnover and generate more sales. So, because of Covid-19, our sales have gone up 15 percent because more people buy food and wait for supermarkets, so we did not have to work hard to do that. But then that's presented us with all the challenges, because we now producing 15 percent more in our factory, but we had to introduce social distancing measures. And any type factory you've ever been around, all designs over the last 20 years are focused on removing dead space, so people are standing right next to each other. And we now had to completely turn that on its head and space people out on the factory"

This comprehensive analysis reveals an understanding that crisis conditions altered the strategic challenge landscape, rather than simply adding complexity to existing business processes. The recognition that increased demand removed traditional growth concerns *"we did not have to work hard to do that"* while introducing new operational difficulties reflects analytical depth and adaptability in problem framing under crisis conditions. The contrast between pre-crisis priorities such as sales growth and pandemic-era challenges such as capacity management, shows strategic awareness of how environmental disruptions shift organisational priorities and require new resource allocation strategies. Where the phrase "*that's presented us with all the challenges*" highlights an understanding that even favourable market changes introduce different forms of complexity.

Furthermore, the ER-6's detailed account of operational adaptations demonstrates approach in innovation that went beyond incremental changes to include a full redesign of core operational systems. The observation that "*all designs over the last 20 years are focused on removing dead space*" demonstrates historical and technical knowledge of optimisation principles in factory settings. Meanwhile, the phrase "*completely turn that on its head*" signals a significant shift from established industry practices, indicating the ability to restructure operational systems in line with health and safety requirements.

In terms of workforce management, ER-6 also demonstrated innovative thinking in human resource allocation, as this was also severely impacted by the Covid-19 implemented restrictions:

"We run longer days, so our employees are still doing the same number of hours in a week, but maybe rather than working for five days, then they work every two or three days... The cost of operating has gone up. So, we have had employees who had self-isolate for two weeks. And so, we still pay them the full salary during that time. That is a cost to the business. And then we have also to start distancing, and the factory, and make sure we have got additional items of PPE for the staff as well. And introduce some physical barriers in the production facility as well to keep people if they cannot stand too close to each other. So all of that has a cost to it...So, it has presented problems for us, and it has pushed up our production cost. So, it does cost us more than that. But there's no way around that"

This indicates a redesign of shift structures that maintained overall working hours while adapting the temporal distribution of labour to new health constraints, where the emphasis on keeping "*the same number of hours in a week*" shows that HGE-6 did not compromise employee welfare for efficiency. But instead aligned operational needs with worker well-being, where this suggests crisis adaptation that considers both productivity and human factors.

Finally, ER-6's reflection on cost implications shows a realistic economic perspective, where it is mentioned "*it has presented problems for us*" and "*it has pushed up our production cost*" or "*there is no way around that*", where this evaluation reflects clear economic reasoning that accepts the financial burden of necessary changes rather than trying to avoid them. The acknowledgement about increased costs points to a willingness to absorb short-term financial impacts caused by crisis to maintain operational effectiveness and safety, as the last phrase reflects strategic acceptance of crisis-related costs and prioritisation of long-term sustainability over short-term savings.

Phase three- Route Map Implementation (June 2020-September 2020)

Selective Resource Utilisation and Strategic Decision-Making

It was previously mentioned that HGE-6 was seeking funding to expand operations into a new facility - one they had already acquired prior to the Covid-19 crisis. During the third phase of the pandemic timeline, ER-6 provided an update on this development, where the provided comments reveal a careful and deliberate approach to decision-making around business expansion that illustrates a commitment to long-term strategic fit over simply taking advantage of available funding:

"There is only one thing we were trying to achieve, and that was to get funding to launch a new fish processing plant... We decided not to go ahead with the project for monetary reasons... Ultimately, so the board of directors at our company decided not to progress with that so we did not accept the offered funding from HIE... It was not so much a proposal from HIE, it was more just the overall business model did not quite stack up for us. It was an internal decision... We have a building, and we will use it for something else, but we just do not know yet"

The phrase "*overall business model did not quite stack up*" indicates that the decision was not made based on a single factor, but rather after a full evaluation of various strategic and financial considerations. This shows that HGE-6 conducted a broad assessment of the expansion opportunity, including its financial, operational, and long-term strategic implications, as the fact that the decision was made by "*the board of directors*" further suggests a strong governance process. Rather than making quick decisions under pressure that could have been posed by a crisis influence, HGE-6 employed a structured internal process that ensured the decision aligned with the enterprise's broader strategy. This highlights a systematic governance structure that supported thoughtful analysis even during a period of external pressure and apparent opportunity.

This illustrates how HGE-6 prioritised long-term business sustainability over short-term gain, despite favourable market conditions and access to external funding, they maintained a high

level of strategic orientation. This reflects a broader theme of strategic restraint under uncertainty, one where objective analysis and internal alignment guided decision-making rather than opportunistic action.

Furthermore, ER-6's reflection on unused assets highlights HGE-6's strategic flexibility and careful resource management during the crisis. Where the statement, "*we have a building and we will use it for something else, but we just do not know yet*" demonstrates a forward-looking approach to resource use, even after a specific expansion plan was put on hold and completely scrapped, suggests that HGE-6 had already invested in infrastructure, creating potential for future development.

This type of asset acquisition gave them flexibility and left the door open for later opportunities, even though the original expansion project was not pursued. Rather than seeing the situation as a loss, HGE-6 retained the asset as a future option, where the follow-up comment *"we will use it for something else"* shows that there is a commitment to making use of the asset in the long term. It also reflects the kind of flexibility that is particularly important in crisis settings, where plans often have to change rapidly in response to evolving conditions.

Rather than rushing to assign a new purpose to the asset, ER-6 acknowledges that decisions sometimes require time and further evaluation. This patience allows the company to wait until the right opportunity arises, rather than making hasty or misaligned decisions under pressure, highlighting a level of strategic discipline and resource awareness well-suited to navigating prolonged uncertainty. Later during this phase, this is what HGE-6 shared in terms of their position and the key aspects they were focusing on, that were also corresponding with the crisis development:

*"The business has very much been steady since we last spoke. The demand from which was scaled back slightly, but it puts a bit more in line with our actual budget position. We are still producing, and everything is still going to *** [a British supermarket chain] ...*We are in a quite fortunate position that we are not under any pressure financially...We keep reviewing our Covid-19 policies and social distancing to make sure we are on top of the latest rise. Our*

biggest worry would be if we had an outbreak in the factory of people who tested positive. But touchwood, that has not happened, and it will not happen"

The ER-6's description of the enterprise as "*very much been steady*" suggests that maintaining stability is a valued outcome during a period of extreme disruption. It highlights that stability, in this context, was not simply a result of being in a resilient industry but was actively preserved through deliberate actions and decisions in response to the uncertainty of COVID-19. When viewed within the wider context of the Covid-19 crisis, where many organisations experienced severe disruptions to demand, supply chains, and internal operations, the above statement of continued steadiness becomes even more meaningful.

The statement "*we are still producing"* and *"everything is still going to* [British supermarket chain]*"* highlights that the HGE-6 successfully maintained its production levels and upheld key supply relationships throughout the crisis, since at a time when supply chains across many sectors were heavily disrupted, this continuity signals a significant achievement.

The statement *"keep reviewing our Covid-19 policies and social distancing to make sure we are on top of the latest rise"* reflects a proactive and continuous approach to crisis management, where the phrase "on top of" implies that the organisation was not merely reacting to changes after they occurred but was actively working to anticipate developments. This suggests overall strategic capability angle that aimed to stay ahead of potential risks rather than waiting for problems to emerge before responding. This type of systematic, routine evaluation reflects a high level of organisational learning and adaptability, because by treating Covid-19 management as an evolving operational issue, rather than a one-time crisis event, the HGE-6 was able to demonstrate an advanced level of strategic thinking capabilities. Where this approach recognises that prolonged crises require sustained attention, not just initial responses.

Phase four- Stabilisation Period (September 2020 - January 2021)

Internal Operational Re-development

While HGE-6 hoped to avoid scenarios in which factory workers would be required to self-isolate, an outcome that would significantly disrupt overall production, nonetheless, they began implementing contingency measures in anticipation of such an event. As ER-6 explained:

"Everything we are doing right now is just keeping the business operating in a COVID-19 environment. So, just to give a little bit more detail, have two production sites that are on there and have some staffs travel between the two sites. What we are working on just now to completely isolate both sites so that there is no crossover of staff between them. And we are thinking if one of the sites had an outbreak of COVID and had closed for two weeks, that the other one could continue to operate. So, that is what we are working on right now"

This reflects a pragmatic crisis response mindset, as rather than focusing on growth or expansion, the goal described by ER-6 is survival through operational continuity. This framing aligns closely with the resilience perspective, where the aim is to sustain core functions amid disruption, rather than adapt for opportunity in the short term. The use of "*everything we are doing*" suggests that crisis management has become fully integrated into daily operations and no longer a separate or temporary layer of activity but embedded into routine processes.

The detailed explanation "*have two production sites that are on there and have some staffs travel between the two sites*" reveals both organisational complexity and vulnerability awareness. The dual-site operation represents pre-crisis organisational development that created operational flexibility and capacity expansion. However, the staff movement between sites, which probably provided operational efficiency and resource optimisation under normal conditions, is now recognised as a critical vulnerability that could enable rapid transmission between facilities. This use of what they already control - two separate facilities, demonstrates effectuation in place, where beginning with available means and recalibrating them to suit unfolding challenges.

The idea of isolating the two sites represents both anticipatory resilience and emergent strategy, as it reflects forward-thinking scenario planning, where the enterprise imagines a

potential worst-case outcome and proactively trying to take control of that. This is a form of strategic foresight under uncertainty, where the decision to decouple operations in anticipation of risk, rather than reacting once disruption occurs that demonstrates pre-emptive adaptation, that is a core capability of resilient enterprises.

Furthermore, the statement "*we are working on just now to completely isolate both sites so that there is no crossover"* reflects a deliberate restructuring of operational design in direct response to pandemic-related risk, where the use of "*completely*" highlights their commitment to full physical separation of its two production sites, indicating a preference for comprehensive preventative measures over partial or temporary solutions.

The phrase "*working on just now*" signals that this is an active, in-progress initiative rather than a retrospective account or speculative future plan. This suggests both urgency and complexity, highlighting the enterprise's recognition of its operational exposure and its decision to act pre-emptively despite the structural and logistical challenges involved. Implementing such a separation entails reassigning staff, redesigning workflows, and developing new coordination mechanisms between sites, thus representing a notable shift in how routine operations are managed.

Furthermore, the quote *"and we are thinking if one of the sites had an outbreak of COVID"* illustrates forward-looking scenario planning rooted in specific contingency assumptions, as the phrase *"we are thinking*" indicates ongoing sense-making on adaptive strategy formulation, reflecting the changeableness of the external environment. It also reveals a mindset adapted to proactive risk mitigation rather than reactive damage control, as such mindset crucial during the crisis period.

When asked whether any new tangible or intangible resources were being sought to mitigate crisis-related risks or to support potential restructuring or strategic pivoting, ER-6 responded as follows:

"We have enough resources to manage the business internally right now"

This statement reflects a position of organisational self-reliance, indicating that HGE-6 currently possesses sufficient internal capacity to navigate the crisis without external assistance, that further implies a comprehensive internal assessment surrounding not only financial assets but also human capital, operational infrastructure, and organisational knowledge.

On the other hand, the temporal qualifier "*right now*" signals a measured and time-bound evaluation of resource adequacy, as rather than projecting long-term certainty, it acknowledges that current sufficiency may not extend indefinitely. This language demonstrates cautious and sensible management, as they try balancing present operational confidence with the awareness that ongoing review and adaptation may be required as conditions evolve. The organisation's ability to maintain operations through internal means, while recognising the temporary nature of such capacity, reflects a strategically cautious approach to crisis resource management.

Phase five- Second Lockdown (January 2021 - March 2021)

Enterprise Capability Assessment and Crisis Response Acknowledgement

This final phase associates with HGE-6's reflection on the enterprise's crisis management response that demonstrates a validation of prior strategic planning efforts, revealing how foresight, operational restructuring, and risk-mitigation strategies transitioned from theoretical preparation to practical application under real-world conditions of disruption and uncertainty. This is what ER-6 shared in the first month of this phase:

"On the first of January, we had a bit of COVID outbreak in the factory here. But we managed to keep, at one point 20 people in self-isolation, but we kept everyone else fit and healthy managed to keep production going. And now today, we don't have anybody in self-isolation. So that's good, managed to get through...I'm glad we did that [separated the two production sites as previously mentioned], because if had not done that, definitely would have spread between the two production sites"

The first part of this statement marks the transition from theoretical risk management to actual crisis experience, representing the moment when carefully planned contingency measures faced real-world testing. The specific date reference to January provides precise temporal frame that suggests this outbreak occurred during the height of winter transmission periods when Covid-19 cases were typically elevated across the UK, thus leading to the second national lockdown. The timing also indicates the outbreak occurred during a holiday period when reduced staffing and changed operational patterns might have created additional management challenges.

The location specification "*in the factory here*" indicates the outbreak occurred at the primary site that was previously mentioned and discussed, suggesting this was significant to central production facility. This detail becomes crucial for understanding the impact assessment and the effectiveness of the site separation strategy that had been implemented as a preventive measure, as the outbreak at this specific location also tests the enterprise's most critical operational capabilities.

Where the ER-6 mentions "*we managed to keep at one point 20 people in self-isolation*" reveals the ability to manage substantial workforce disruption while maintaining core operations, as the figure "*20 people*" represents a significant portion of workforce for most SME operations, suggesting the outbreak created substantial operational challenges that required extensive management attention and resource redistribution to maintain production capabilities. Furthermore, the phrase "*at one point*" indicates the peak impact period, suggesting the isolation numbers varied over time as contact tracing, testing, and quarantine requirements evolved. This variation indicates they managed a complex, evolving situation rather than a static workforce reduction, requiring ongoing assessment of workforce availability, production capacity, and operational requirements as circumstances changed throughout the outbreak period.

Moreover, the remark "*I'm glad we did that*" indicates that the preventative action of isolating the two production sites to avoid staff crossover proved effective. This retrospective validation shows that decisions made earlier in the crisis were not only theoretically sound but also operationally impactful when tested. The comment "*definitely would have spread between the two production sites*" points to the anticipated severity of a 'worst-case scenario' and affirms the organisation's foresight in implementing strategy on separation of operations.

Additionally, the reference to previous separation decisions creates a narrative connection between proactive planning and crisis response effectiveness, demonstrating the value of anticipatory crisis management. This connection validates not just the specific separation strategy but also the broader approach of implementing difficult preventive measures based on potential rather than actual problems.

As the Covid-19 pandemic extended beyond initial emergency responses into prolonged operational adjustments, enterprises faced increasingly complex challenges in managing diverse workforce needs while adapting physical infrastructure to new health requirements. This is where the ER-6 shared concerns related to employee mental health considerations, and spatial resource reallocation during the extended crisis period to be able to provide needed support:

“We've basically had a lot of office space staff who've been working from home for almost a year now and there's a number of them who are really starting to find it really tough. The bigger perception in the media, that's quite fun working from home, it's not really difficult to get five days a week, 11 months at all, you know? So yes, that is starting to give us a few issues. And we're trying to see can we legally get people back into the office even just for a day or two, just to help them from the mental health side of things...What we've actually been talking about is some of the office space we have had here, we actually had to convert it into additional canteen space for the guys on the factory floor, so that they can maintain a social distance on their break. So, we are acutely aware that when staff can start coming back to work, even if it's just for one or two days a week, there are not enough desks for everyone”

The ER-6’s reflection demonstrates the evolution from reactive crisis management to proactive consideration of longer-term implications, highlighting how crisis navigation requires continuous assessment of changing employee needs and operational constraints thus presenting a continuous process of sense-making. The acknowledgment that "*there's a number of them who are really starting to find it really tough*" reveals emerging patterns of

remote work fatigue and psychological strain that developed over extended periods of crisis development, where this situation was not unique to only HGE-6.

The recognition of employee difficulty indicates awareness and monitoring of workforce wellbeing beyond immediate productivity measures, rather than assuming remote work arrangements remain satisfactory over extended periods. The identification of emerging problems also indicates to the implementation of communication channels and feedback mechanisms that enable remote workers to express concerns about their working conditions. The inquiry about "*can we legally get people back into the office*" reveals the enterprise's navigation of complex regulatory environments where government restrictions limited workplace occupancy during various lockdown phases, where the proposal "*even just for a day or two"* indicates realistic assessment of what might be possible under restrictions while providing meaningful psychological relief for affected employees.

The decision to convert office space rather than seeking external solutions or reducing break time quality indicates commitment to employee welfare and willingness to sacrifice future office capacity to meet immediate health and safety needs. Where ER-6 references to "*we've actually been talking about*" reflects an ongoing sensemaking process, grounded in prior experience of space conversion (canteen space), yet also indicating that no definitive decisions or actions have been taken at this stage.

The phrase "we actually had to convert it into additional canteen space" reveals resource reallocation that was driven by necessity rather than strategic choice, indicating external pressures that mandated fundamental changes to established spatial arrangements. The emphasis on "had to" suggests this conversion was not optional or preferred but required to meet health and safety obligations that emerged during the pandemic. The decision-making regarding the conversion from office space to canteen facilities represents structural transformation of work areas designed for typical office tasks to communal areas designed for social interaction and food consumption. This transformation required not just furniture rearrangement but involved infrastructure adjustments including food service capabilities, cleaning requirements, ventilation considerations, and health compliance measures that differ substantially between office and dining environments.

Towards the end of this last stage, the ER-6's shares the decisions that were associated with a crisis-driven communication transformation and consequential leadership evolution:

"I would say that Covid has actually done us good, as our leadership team brought closer together. Because prior to Covid, we only used to meet once a month as a leadership team, to have to catch ups. But because of Covid, we moved into crisis mode, what we started with having a daily catch-up with using Microsoft Teams. So, for half an hour, first thing in the morning, and then going to into October, November time when things were a bit better, we decided to keep all the meetings in place just so we could keep in communication with each other. And then Covid kicked off again in January in February, it was good voted out to keep meetings there. So, I guess what it's told me is the biggest learning is communication, that we as a senior leadership team weren't communicating enough prior to Covid"

The opening statement presents a counter-narrative to typical crisis impact stories by framing the pandemic as a positive force for organisational development, where the phrase "*done us good*" emphasises on genuine benefit rather than forced optimism about difficult circumstances. This framing suggests the HGE-6 discovered unexpected advantages within crisis conditions, indicating refined leadership perspective that can identify opportunities for improvement even during challenging periods. The specific focus on bringing "*our leadership team closer together*" indicates the pandemic created conditions that enhanced collaboration, communication, and relationships among senior management.

The crisis conditions created necessity for closer cooperation that revealed benefits the organisation had not previously prioritised or achieved through normal operational periods. This unexpected positive outcome demonstrates how crisis conditions can force organisational changes that prove beneficial beyond their immediate necessity, creating lasting improvements that might not have been pursued during normal operational periods. The phrase "*only used to meet once a month*" suggests retrospective recognition that this frequency was insufficient for optimal leadership coordination, though it may have seemed adequate at the time. This further demonstrates rapid adaptation to crisis conditions through dramatically increased communication frequency and the transition from monthly to daily

meetings represents a fundamental shift in leadership coordination that required significant time investment and schedule reorganisation. This significant frequency increase indicates recognition that crisis conditions demanded much closer coordination than normal operational periods. Additionally, the specification "*for half an hour, first thing in the morning"* indicates systematic scheduling at the beginning of each workday, where this timing ensures leadership alignment before daily operations begin. The defined duration suggests structured meetings focused on essential coordination rather than extended discussions during crisis periods.

The decision *"to keep all the meeting in place"* highlights conscious decision-making about communication sustainability beyond immediate crisis necessity, indicating leadership consensus that enhanced communication provided ongoing value beyond crisis management requirements.

When the second lockdown came into force, the assessment "*it was good voted out to keep meetings there*" provides validation of the communication enhancement decision through subsequent crisis experience. Where the phrase "*kicked off again*" references the renewed intensity of Covid-19 impacts during winter 2021 when infection rates increased, and additional restrictions were implemented, as this second crisis wave tested the HGE-6's adapted communication patterns under renewed pressure conditions. This pattern indicates mature enterprise learning that integrates crisis experiences into ongoing operational practices rather than viewing crisis adaptations as temporary measures to be discarded when conditions improve.

In conclusion, the *High Growth Enterprise six* demonstrates that sector positioning can fundamentally alter crisis management requirements in the decision-making process and opportunities identification, enabling strategic approaches that pursue growth and development rather than simply managing survival. Their precise integration of opportunity recognition with risk management, operational innovation with strategic reframing, and crisis response development illustrates advanced crisis management capabilities that exceed environmental constraints.

The case of *High Growth Enterprise six* reveals how favourable sector positioning combined with sophisticated crisis management capabilities can enable crisis experience through

strategic advancement rather than simple crisis survival through resource conservation. The systematic extraction of organisational learning from crisis experiences, while maintaining operational effectiveness demonstrates that crisis periods can serve as accelerated organisational development opportunities for companies with appropriate strategic positioning and management capabilities.

Characteristics	Key Events & HG6 Enterprises' Responses	Theoretical and Organisational Insights
Phase 1: Trigger Event		
Crisis Assessment and Scenario Planning	WHO pandemic declaration and UK lockdown • Essential business classification enabling continued operations • Conducted 3-4 weeks of scenario planning before crisis impact • Orders "went through the roof" whilst workers began self-isolating	Strategic analysis employing formal planning procedures • Proactive preparation versus reactive crisis management • Environmental scanning and strategic preparation capabilities • Market analysis of sector-specific crisis effects
Operational Constraint Recognition	Surge demand exceeding normal operational capacity • Workforce self-isolation creating significant operational issues • Recognition of production system vulnerabilities	Understanding operational constraint management requirements • Analytical capability for capacity requirement assessment • Immediate strategic planning addressing constraint management
Conservative Growth Strategy	"All growth plans have been put on hold" despite favourable market conditions • Focus on "using all our resources as much as possible" • Resource optimisation rather than capacity expansion	Crisis management prioritising resource strengthening over expansion • Understanding operational constraint management importance • Strategic caution despite positive market signals
Contingency Resource Planning	Identified HIE workforce support channels as backup • "Good skill set to cope" but prepared for scenarios if things "go drastically wrong" • Funding identified as primary constraint	Contingency planning for workforce disruption scenarios • Current capability assessment with future scenario preparation • Realistic assessment of uncertainty and requirement change potential
Phase 2: Reorientation and Crisis Layering		

Crisis-Driven Expansion Evaluation	Approached HIE for funding support to "grow the business and open up a new production unit" • Pre-existing building asset providing expansion flexibility • £1.2 million development cost with half self-funded	Strategic thinking replacing initial caution with growth willingness • Proactive response to crisis-induced demand • Forward-thinking asset acquisition enabling flexibility • Resource allocation balancing stability with readiness
Operational Adaptation Innovation	15% sales increase requiring production restructuring • Factory design "completely turn that on its head" for social distancing • Shift structure redesign maintaining employee hours whilst adapting to health constraints	Innovation beyond incremental changes to full operational redesign • Historical understanding of optimisation principles adaptation • Crisis adaptation considering productivity and human factors • Strategic acceptance of crisis-related costs
Strategic Cost Management	Unnecessary capital expenditure "on hold for six months" rather than cancelled • Increased production costs accepted as necessary • Employee welfare prioritisation during self-isolation periods	Strategic financial decision-making preserving future options • Resource flexibility enabling response to changing conditions • Realistic economic perspective accepting necessary financial burdens
Phase 3: Route Map Implementation		
Strategic Decision Discipline	Board decision not to proceed with expansion despite HIE funding offer • "Overall business model did not quite stack up" • Internal decision prioritising long-term strategic fit	Strategic restraint under uncertainty • Objective analysis and internal alignment over opportunistic action • Structured governance ensuring decision alignment with broader strategy
Asset Flexibility Management	Pre-existing building retained for future use • "We will use it for something else, but we just do not know yet" • Strategic patience avoiding hasty repurposing decisions	Strategic flexibility and resource management • Asset acquisition providing future option value • Strategic discipline avoiding premature operational commitments

Operational Stability Achievement	Business described as "very much been steady" • Continued production and supermarket supply relationships • Demand "scaled back slightly" to align with budget position	Stability preservation through deliberate actions • Supply chain continuity achievement during widespread disruption • Proactive crisis management staying ahead of potential risks
Continuous Risk Management	"Keep reviewing our Covid-19 policies and social distancing" • Staying "on top of the latest rise" • Factory outbreak identified as biggest worry	Continuous approach to crisis management • Systematic routine evaluation reflecting organisational learning • Advanced strategic thinking treating crisis as evolving operational issue
Phase 4: Stabilisation Period		
Operational Resilience Development	Complete isolation of two production sites to prevent cross-contamination • Elimination of staff crossover between facilities • Anticipatory planning for potential outbreak scenarios	Pragmatic crisis response mindset focused on operational continuity • Anticipatory resilience and emergent strategy development • Pre-emptive adaptation as core resilient enterprise capability
Risk Mitigation Infrastructure	"If one of the sites had an outbreak... the other one could continue to operate" • Comprehensive preventative measures over partial solutions • Active restructuring of operational design in response to pandemic risk	Strategic foresight under uncertainty • Comprehensive risk mitigation preference • Deliberate operational restructuring for pandemic response
Self-Reliant Resource Position	"We have enough resources to manage the business internally right now" • Sufficient internal capacity without external assistance • Measured evaluation of resource adequacy with temporal awareness	Organisational self-reliance and comprehensive internal assessment • Cautious management balancing confidence with ongoing review awareness • Strategic resource management approach to crisis navigation

Integrated Crisis Management	Crisis management "fully integrated into daily operations" • No longer separate activity but embedded in routine processes • Everything focused on "keeping the business operating in a COVID-19 environment"	Crisis management integration into operational routine • Resilience perspective sustaining core functions amid disruption • Effectuation using available means recalibrated for emerging challenges
Phase 5: Second Lockdown		
Crisis Response Validation	January 1st COVID outbreak with 20 people in self-isolation • Production maintained despite substantial workforce disruption • Site separation strategy proved effective in preventing spread	Transition from theoretical risk management to practical application • Workforce disruption management whilst maintaining core operations • Retrospective validation of proactive planning effectiveness
Extended Crisis Adaptation	Office staff working from home for "almost a year" experiencing mental health challenges • Office space converted to additional canteen space for social distancing • Legal exploration for partial office return	Evolution from reactive crisis management to long-term implication consideration • Resource reallocation driven by necessity rather than choice • Structural transformation of work environments
Leadership Development Enhancement	Daily Microsoft Teams meetings replaced monthly meetings • Leadership team "brought closer together" • Communication frequency increase maintained even during improved periods	Crisis conditions forcing organisational changes proving beneficial beyond necessity • Rapid adaptation through dramatically increased communication frequency • Crisis experience integration into ongoing operational practices
Organisational Learning Integration	"Covid has actually done us good" • Recognition that pre-crisis communication was insufficient • Maintained enhanced communication patterns through second wave	Counter-narrative framing pandemic as positive organisational development force • Unexpected advantage identification within crisis

		conditions • Crisis periods as accelerated organisational development opportunities
Strategic Communication Evolution	"Biggest learning is communication" • Daily coordination ensuring leadership alignment before operations • Structured meetings focused on essential coordination during crisis	Conscious decision-making about communication sustainability beyond crisis • Mature enterprise learning integrating crisis experiences into practices • Crisis adaptations treated as permanent improvements rather than temporary measures

Table 5.5 - Summary table of the HGE-6 case study that captures the key information across all five phases, Author 2024

Conclusion

Not to overwhelm the findings chapter, it was the researcher's decision to leave this chapter as a comprehensive and detailed description of each case's account with a phase by phase write up. This was done to present each case in rich details, to highlight the journey of each individual enterprise through this crisis. Therefore, this chapter has presented detailed longitudinal evidence from six high-growth Scottish SMEs as they navigated the COVID-19 pandemic across five distinct temporal phases from March 2020 to March 2021. Through rich narrative accounts and extensive participant quotations, the chapter has documented the complex, evolving nature of sense-making, decision-making and overall crisis management practices during extreme uncertainty, revealing the adaptive processes that unfolded within each enterprise context. The thematic analysis and discussion that comes as a result of such a rich and detailed write up will be presented in the next chapter, as per researcher's decision to leave this chapter the way it currently stands.

The chapter has illuminated the multifaceted nature of crisis response across diverse SME contexts. Each case demonstrated unique pathways through the crisis, shaped by sector positioning, pre-crisis strategic decisions, resource availability, and enterprise-specific capabilities. The HGE-1's journey from drainage services provider through compound crisis challenges to value-based strategic reorientation showcased how crisis can fundamentally reshape entrepreneurial identity and purpose, or where HGE-2's deliberate diversification strategy provided both operational resilience through multiple revenue streams and cognitive advantages through varied environmental scanning capabilities, enabling proactive crisis preparation by the second lockdown. The HGE-3's innovation-driven response revealed how technological infrastructure and network relationships could enable rapid community contribution while building lasting organisational confidence. The transformation from design consultancy to temporary medical equipment manufacturer within weeks demonstrated remarkable adaptive capacity when crisis conditions aligned with existing capabilities. Or where HGE-4's digital transformation journey illustrated how extreme constraints could force fundamental business model evolution, enabling a hospitality-focused micro-enterprise to achieve growth during continued crisis conditions through strategic resource acquisition and implementation.

The case of HGE-5's mature enterprise with resource-adequate position enabled strategic patience and selective institutional engagement, demonstrating crisis management approaches that prioritised autonomy while systematically evaluating opportunities and constraints. Their analytical approach to workforce management, cost optimisation, and strategic decision-making under uncertainty revealed sophisticated crisis management capabilities developed through organisational maturity. Or where HGE-6's essential business position created surge demand that required operational innovation to manage increased production while implementing comprehensive health and safety measures, ultimately leading to enhanced leadership coordination and communication practices.

The five-phase temporal framework has revealed consistent patterns in crisis development while highlighting enterprise-specific variations in response and adaptation. Phase one consistently created fundamental disruption to established sense-making frameworks, yet enterprises demonstrated varying capabilities for rapid environmental assessment and strategic reorientation. Phase two involved strategic pivoting and information processing, with enterprises developing enhanced understanding of crisis support systems and market dynamics. Phase three, coinciding with the Scottish Government's route map implementation, revealed complex challenges in balancing recovery opportunities with ongoing constraints. Some enterprises, like HGE-1, experienced strategic paralysis, while others, like HGE-2 and HGE-3, pursued active opportunity development. Phase four demonstrated stabilisation and strategic development activities, with enterprises integrating crisis learning into forward-looking planning. Lastly, phase Five, the second lockdown period, validated enhanced crisis management competencies across all cases, with enterprises demonstrating remarkable improvement in crisis preparation and response capabilities.

In other words, this chapter has documented sense-making processes operating across multiple dimensions simultaneously. Retrospective sense-making enabled enterprises to reinterpret past decisions and extract strategic insights from crisis experience, where prospective sense-making constructed future possibilities within constraint conditions, enabling continued strategic development during uncertainty. Enactive sense-making created opportunities through interpretive action, transforming crisis conditions into strategic advantages. These processes operated through complex temporal orientations, with enterprises simultaneously managing immediate survival needs, medium-term adaptation

requirements, and long-term strategic positioning. The integration of analytical assessment with emotional processing proved crucial for sustained crisis navigation, particularly during extended uncertainty periods when cognitive resources became strained.

Perhaps most significantly, the chapter has revealed the remarkable diversity in crisis experience across different enterprise contexts. Sector positioning fundamentally shaped crisis impact and management options, with essential businesses facing different challenges than those in severely restricted sectors. Pre-crisis strategic positioning influenced adaptive capacity, while enterprise maturity and resource availability determined available response options. This diversity challenges any notion of universal crisis management approaches, instead highlighting the importance of context-specific adaptation that leverages enterprise-specific capabilities while addressing unique constraint configurations. Throughout all six cases, the chapter has revealed crisis management as a complex, multi-dimensional activity involving simultaneous attention to operational continuity, strategic development, stakeholder management, and organisational learning.

The longitudinal perspective has shown how crisis management capabilities evolved through accumulated experience, with enterprises developing increasingly sophisticated approaches to environmental scanning, strategic decision-making, and resource optimisation over time. The second lockdown period provided validation that genuine learning had occurred rather than simple crisis survival. This findings chapter has established the empirical foundation for understanding how high-growth potential Scottish SMEs navigated extreme uncertainty through sophisticated sense-making and adaptive management practices. The thematic analysis and discussion presented in the next chapter, will move beyond descriptive accounts to develop theoretical understanding of how these enterprises constructed meaning from extreme uncertainty, adapted their strategic practices, and evolved their crisis management capabilities.

Chapter six: Analysis and Discussion on Evolution of Crisis Management Capabilities in High-Growth Scottish SMEs

Introduction

The global COVID-19 crisis presented an extraordinary opportunity to observe organisational responses to extreme disruption in real-world conditions (Kraus et al., 2020; Kuckertz et al., 2020). While existing crisis management literature predominantly examines large-scale corporate responses through retrospective case studies or cross-sectional snapshots (Bundy et al., 2017; Williams et al., 2017), this investigation adopted a longitudinal approach to monitor high-growth Scottish SMEs as they encountered sequential waves of environmental turbulence beginning in March 2020. These entrepreneurially oriented enterprises, distinguished by their growth trajectories and adaptive capacity (Davidsson et al., 2020), offered unique visibility into the mechanisms through which organisations can cultivate advanced crisis navigation competencies and change trajectories of their development (Herbane, 2010; Smallbone et al., 2012).

This chapter presents a comprehensive analysis and discussion of crisis management capability development, sense-making and decision-making across six high-growth potential Scottish SMEs during the COVID-19 pandemic spanning from March 2020 to March 2021. Rather than treating crisis management as a static set of responses, this analysis reveals how these enterprises developed increasingly complex capabilities through accumulated learning across five distinct temporal phases. The phase-based analytical approach demonstrates how crisis management and subsequent decision-making effectiveness emerges through dynamic processes of sense-making evolution, strategic resource innovation, value-driven decision-making, and institutional ecosystem navigation that compound over time (Kuckertz et al., 2020; Kraus et al., 2020; Papadopoulos et al., 2020). Each phase built upon previous learning while creating new challenges that required enhanced capabilities. Where the enterprises demonstrated not merely reactive adaptation but proactive capability development that transformed crisis conditions, allowing enterprises to survival as well as leading them towards strategic opportunities.

Traditional crisis management literature focuses on damage mitigation across crisis phases (Bundy et al., 2017; Pearson & Clair, 1998), with each phase representing different levels of

damage control. This research reveals that each temporal phase represents distinct capability development opportunities, with enterprises demonstrating increasingly sophisticated crisis management capabilities that compound over time. This reframes crisis phases from damage assessment to organisational development stages, representing a shift in crisis management research.

The analysis moves beyond descriptive accounts to develop theoretical understanding of how these enterprises constructed meaning from extreme uncertainty, adapted their strategic practices, and evolved their crisis management capabilities over time. Through systematic cross-case analysis and temporal process examination (Gehman et al., 2018; Langley et al., 2013), this chapter reveals the complex mechanisms underlying SME crisis management while contributing to theoretical understanding of sense-making, resource arrangement, and strategic adaptation under extreme conditions.

Furthermore, the analysis and discussion presented here, demonstrates that crisis management in high-growth SMEs represents a fundamentally dynamic process characterised by temporal learning accumulation, strategic resource innovation, and collaborative sense-making evolution. The Covid-19 context provides unique insights into digital transformation acceleration (Kraus et al., 2020), virtual stakeholder engagement (Papadopoulos et al., 2020), and ecosystem-level resilience building (Cowling et al., 2020) that previous crisis studies could not capture due to their limited scope and different technological contexts.

As it was mentioned before, this thesis does not view crisis response as isolated operational adjustments, but as a dynamic process, as the evidence reveals patterns or themes of organisational development that enabled not merely survival but strategic transformation and enhanced competitive positioning (Duchek, 2020; Burnard & Bhamra, 2019; Williams et al., 2017). Through systematic comparative examination, this analysis reveals both fundamental commonalities and significant divergences in crisis management practices across six high growth enterprises, where strategic orientations, and capability development patterns emerged in response to the evolving dynamics of the pandemic. The analysis moves beyond individual case descriptions to identify underlying mechanisms and patterns that explain how different organisational characteristics, sector positions, and strategic orientations shaped varying but often equally effective approaches to crisis management.

Rather than seeking a single optimal crisis management approach, this analysis demonstrates how successful crisis navigation emerged through different combinations of sense-making processes, resource orchestration strategies, value-based decision-making frameworks, and institutional relationship development. The temporal dimension proves crucial for understanding these patterns, as the analysis reveals how initial crisis responses created trajectories that shaped subsequent capability development and strategic evolution across all five phases. To remind, these are the five crisis phases identified in the empirical findings of this thesis:

- March 2020: WHO declares the Covid-19 virus a pandemic. PM announces the first lockdown in the UK, ordering people to “stay at home”. Lockdown measures legally come into force.
- April to June 2020: Scottish Government announces several business relief funding opportunities. Lockdown extended for “at least” three weeks.
- June to September 2020: Scottish Government publishes a Covid -19 Routemap to take Scotland through and out of the Covid -19 pandemic. First Minister Nicola Sturgeon announces the move to Phase 1 of the route map out of lockdown, beginning on Friday, 29 May 2020.
- September 2020 to January 2021: Lockdown restrictions eased further, including reopening indoor theatres, bowling alleys and soft play. Scottish Government announced that Scotland is to remain in Phase 3 of the route map, as Covid -19 remains a significant threat to public health.
- January to March 2021: Mainland Scotland goes into another national lockdown

It is done this way, as each phase reveals different aspects of capability development while contributing to an integrated understanding of how high-growth SMEs can emerge stronger from extreme uncertainty. Furthermore, the findings challenge conventional crisis management frameworks that assume uniform responses to external shocks, instead revealing how enterprise-specific characteristics interacted with changing crisis conditions to create distinct but effective crisis management approaches. It additionally demonstrates that while surface-level responses varied dramatically across cases, deeper patterns of learning accumulation, capability development, and strategic adaptation revealed common

underlying mechanisms that enabled greater crisis outcomes across different organisational contexts.

Phase One Analysis - Cognitive Disruption and Initial Sense-Making (March 2020)

The immediate impact of the WHO pandemic declaration and UK lockdown announcement in March 2020 initiated the sense-making crisis process across all six enterprises, regardless of their sector positioning, organisational maturity, or resource reserves. This universal disruption manifested through the complete breakdown of established interpretive frameworks that had previously enabled coherent organisational action and strategic planning. Every enterprise experienced what Weick (1995) identifies as the collapse of *meaning - making systems*, and by recent cognitive disruption research (Cornelissen et al., 2020; Maitlis & Christianson, 2014), forcing immediate suspension of growth plans, strategic initiatives, and forward-looking activities as cognitive resources shifted entirely toward immediate survival concerns and crisis comprehension. This is evident in the previous chapter in *phase one* findings.

The universality of this initial disruption proves particularly significant because it occurred across enterprises with vastly different characteristics and market positions, supporting recent research on organisational cognition under extreme uncertainty (Helfat & Peteraf, 2015; Eggers & Kaplan, 2013). For instance, the HGE-1's characterisation of March as "*an absolute nightmare*" and HGE-4's description of being "*very much up in the air*" reflected the same fundamental cognitive disruption experienced by the more mature and well-resourced enterprises like HGE-5 and HGE-6, though their expressions of this disruption took different forms. This universal experience suggests that extreme environmental discontinuity creates sense-making challenges that transcend organisational boundaries and capabilities, forcing all enterprises into fundamental interpretive framework reconstruction regardless of their previous strategic capabilities or crisis preparedness.

Every enterprise suspended non-essential expenditure, redirected existing capabilities toward crisis-relevant applications, and adopted what can be characterised as affordable loss frameworks for decision-making under radical uncertainty. The immediate resource reallocation patterns also demonstrated application of effectuation logic (Sarasvathy, 2001; Read et al., 2016; Reymen et al., 2015), with all enterprises engaging in means-driven

adaptation under extreme constraint. However, the sophistication and strategic implications of these resource reallocations varied significantly based on the enterprise's existing capabilities and strategic positioning, creating the foundation for divergent developmental trajectories that would characterise subsequent crisis phases.

Recent empirical evidence from Adam and Alarifi (2021) strongly supports these findings, demonstrating that SMEs across different contexts experienced similar patterns of initial disruption during COVID-19, with 259 SME managers in Saudi Arabia reporting comparable challenges including operational paralysis, financial constraint, and cognitive overwhelm. This universality of initial impact has been confirmed across multiple studies, with systematic reviews identifying seven essential pandemic risk impacts for SMEs: human movement restrictions, financial constraints, operational challenges, logistics difficulties, delayed business reopening, short-term policy focus and tacit knowledge workers (Pankaj & Kumar, 2023). The consistency of these patterns across diverse geographical and sectoral contexts validates the theoretical framework's applicability beyond the Scottish context.

Phase one revealed fundamental differences in how all six enterprises experienced and responded to sense-making breakdown, challenging assumptions about uniform crisis response patterns. These patterns align with what Weick (1995) identifies as variation in "sense-making resilience" based on cognitive complexity and interpretive flexibility, that is supported by recent research on managerial cognition under uncertainty (Helfat & Peteraf, 2015; Shepherd et al., 2015). Where the variation supports cognitive load theory (Sweller, 1988) and aligns with current cognitive load research (Sweller et al., 2019; Van Merriënboer & Sweller, 2010) arguments about individual differences in processing capacity under stress, while extending this to organisational level analysis of collective sense-making capabilities. These patterns proved crucial for understanding subsequent crisis management evolution, as initial responses created developmental trajectories that shaped learning accumulation and capability development throughout the entire crisis period.

Patterns of Crisis Impact and Response

The first pattern, exemplified by HGE-1 and HGE-4, involved complete cognitive disruption where existing interpretive frameworks proved entirely inadequate for crisis comprehension and response. These enterprises experienced overwhelming cognitive load that temporarily

paralysed strategic thinking and decision-making capabilities, aligning with recent research on entrepreneurial cognition under extreme uncertainty (Shepherd et al., 2015; Hmieleski & Baron, 2009). The isolation experienced by these single-entrepreneur enterprises compounded the cognitive disruption, as they lacked organisational resources for distributed sense-making and collaborative problem-solving that might have accelerated recovery from initial disorientation (Balogun & Johnson, 2004; Maitlis, 2005).

Additionally, identity construction, Weick's first property, became particularly problematic as enterprises struggled to maintain coherent organisational identity when established roles and relationships became obsolete. Again, this is where HGE-1's characterisation of March as "*an absolute nightmare*" reflects what Weick (1995) describes as identity crisis where "who we are as an organisation" becomes unclear when environmental conditions exceed interpretive capacity. This identity disruption supports Weick and Sutcliffe's (2007) and recent research on organisational identity during crises (Ravasi & Schultz, 2006; Gioia et al., 2013) argument that extreme conditions create "mindful organising" breakdowns where established cognitive routines become counterproductive rather than adaptive. They define “mindful organising” as a set of processes that enable organisations to detect and correct errors, particularly in high-risk or complex environments, where this is particularly important for high growth enterprises. It involves being sensitive to potential problems, avoiding oversimplification, and fostering a culture where expertise is valued over rank.

Furthermore, the retrospective property became compromised as these enterprises found that past experience provided inadequate guidance for unprecedented conditions, supporting Weick's (1995) argument that "people can know what they are doing only after they have done it" (p. 24); as HGE-4's description of complete uncertainty of being "*very much up in the air*" also illustrates how retrospective sense-making failed when historical precedents became irrelevant for current decision-making.

However, this complete disruption paradoxically created opportunities for fundamental framework reconstruction that would ultimately enable the crisis management capability development. The forced abandonment of existing approaches took innovative sense-making and strategic development that produced capabilities exceeding those of enterprises that could adapt existing frameworks more easily. The severity of initial disruption has stimulated deeper learning and more fundamental capability development, suggesting that crisis

management effectiveness may sometimes emerge through breakdown and reconstruction rather than smooth adaptation of existing capabilities.

The second pattern, demonstrated by HGE-2 and HGE-3, involved rapid capability reorientation that leveraged existing organisational strengths for immediate crisis response on organisational agility (Teece et al., 2016; Felipe et al., 2017). These enterprises quickly recognised crisis opportunities within their existing capability sets and achieved immediate strategic pivoting while maintaining operational focus and strategic coherence. HGE-3's immediate recognition that existing equipment could be used to "*create shields and other materials that local hospitals can use"* and HGE-2's systematic focus on digital channels while suspending other activities illustrate how innovation-oriented organisational cultures enabled rapid adaptation without complete strategic disorientation.

The rapid reorientation capabilities have emerged from pre-existing organisational characteristics including experimental mindsets, technological flexibility, and strong external network relationships that provided both capability resources and market intelligence for effective crisis response. These enterprises benefited from organisational cultures that normalised experimentation and adaptation, enabling them to treat crisis conditions as opportunities for innovative application of existing capabilities rather than threats requiring defensive responses. The technological infrastructure and network relationships provided both the means for rapid adaptation and the market access necessary for effective implementation of crisis-driven innovations.

The third pattern, exhibited by HGE-5 and HGE-6, involved systematic risk evaluation that maintained analytical control through comprehensive assessment of crisis implications across multiple dimensions. These mature enterprises with strong resource positions could afford strategic patience while conducting thorough evaluation of crisis impacts and response options. This is where the HGE-5's careful assessment that "*we are quite okay as we have a good cash flow and until May we should be alright*" and HGE-6's systematic "*scenario planning*" approach illustrate how established analytical frameworks and substantial resource cushions enabled methodical crisis response rather than reactive adaptation.

Pattern	Enterprises	Response Characteristics	Key Behaviours	Strategic Outcomes
Complete Cognitive Disruption	HGE-1, HGE-4	Overwhelming cognitive load, strategic paralysis	"Absolute nightmare" (HGE-1), "Very much up in the air" (HGE-4)	Forced framework reconstruction, potential for deeper learning
Rapid Capability Reorientation	HGE-2, HGE-3	Quick crisis opportunity recognition	(HGE-3) - 20,000+ face shields production; (HGE-2) - Digital channel focus	Maintained operational coherence, strategic pivoting
Systematic Risk Evaluation	HGE-5, HGE-6	Comprehensive crisis assessment	"Good cash flow until May" (HGE-5), "Scenario planning" (HGE-6)	Strategic patience, analytical control

Table 6.0 - Three Enterprise Response Patterns, Author, 2024

Extending this and drawing on Stones' (2005) strong structuration framework and recent structuration research (Pozzebon, 2004; Greenwood et al., 2017), the crisis onset created what he identifies as "critical structural moments" where established relationships became unstable and required reconstruction. This is where the crisis demonstrated what Stones terms "agent's context analysis" where enterprises systematically evaluated their "position-practice relations" within changed structural conditions. Drawing on the example of HGE-5's careful assessment of a good cash flow until May illustrates analytical conduct that evaluates structural constraints while identifying opportunities for strategic action. This analysis supports Stones' argument that effective organisation requires capable understanding of structural conditions and position-specific constraints and opportunities.

This systematic evaluation approach reflected organisational maturity and resource abundance that provided options unavailable to resource-constrained or early-stage enterprises. These enterprises could maintain analytical decision-making processes during initial crisis uncertainty because their resource positions reduced immediate survival

pressures that forced more rapid responses from other enterprises. However, this analytical advantage potentially created disadvantages in terms of response speed and strategic innovation, as systematic evaluation processes required time that might result in missed opportunities for rapid adaptation and market positioning during rapidly changing crisis conditions.

Crisis Adaptation under extreme uncertainty

As it was mentioned before, phase one demonstrated how crisis conditions activated effectuation logic (Sarasvathy, 2001, 2008; Chandler et al., 2011; Reymen et al., 2015) across all enterprises, but with varying degrees of sophistication based on pre-crisis capabilities and resource positions. The resource reallocation patterns demonstrated what she identifies as effectuation logic under extreme uncertainty, where enterprises focused on available means rather than predetermined goals when traditional planning became inadequate. All enterprises exhibited what terms the "bird-in-hand" principle by leveraging existing capabilities for novel applications, supporting her argument that "effectuation processes take a set of means as given and focus on selecting between possible effects" (Sarasvathy 2001, p. 245). However, the capabilities of effectuation application varied significantly based on entrepreneurial experience and cognitive flexibility, supporting recent effectuation research (Perry et al., 2012; Brettel et al., 2012) argument that effectuation effectiveness depends on entrepreneurial expertise and environmental scanning capabilities.

Means-driven crisis adaptation was seen in HGE-3's immediate redeployment of laser cutting and 3D printing technology for medical equipment production that exemplifies effectuation logic where rapidly assessed available means and identified novel applications. The enterprise's existing technological infrastructure enabled business model transformation within weeks, but the strategic insight lay in understanding how crisis conditions altered competitive dynamics where speed became more valuable than optimisation. This contrasts with HGE-1's more limited initial resource redeployment, where drainage services capabilities provided fewer obvious crisis applications. The comparison reveals that effectuation effectiveness under crisis depends heavily on the versatility of existing capabilities and the entrepreneur's ability to envision novel applications under changed environmental conditions.

However, the sophistication of effectuation application varied significantly based on entrepreneurial experience and cognitive flexibility, supporting Sarasvathy's (2008) argument that effectuation effectiveness depends on entrepreneurial expertise and environmental scanning capabilities. The variation aligns with Read et al.'s (2009) finding that experienced entrepreneurs apply effectuation principles more systematically than novice entrepreneurs, extending this to show how organisational characteristics influence effectuation implementation during crisis conditions.

The effectiveness of effectuation logic during COVID-19 has been empirically validated through quantitative research showing that digitalisation enabled SMEs to respond effectively to the public crisis by leveraging their dynamic capabilities, with 518 Chinese SMEs demonstrating enhanced crisis response strategies through digital resource recombination (Guo et al., 2020). This supports the finding that effectuation sophistication varies based on available technological infrastructure and organisational capabilities.

Affordable loss frameworks under extreme uncertainty were more prominently seen on HGE-4, where the crisis forced immediate implementation of affordable loss principles, but with compressed timeframes that challenged traditional risk assessment. HGE-4's decision to "move quickly" rather than pursue collaborative approaches demonstrates how crisis urgency can override normal risk evaluation processes. The phrase "it felt like the right thing for me to do" reveals how affordable loss calculations under extreme uncertainty may rely more on intuitive assessment than analytical evaluation. The affordable loss framework became immediately relevant as enterprises faced existential uncertainty about future viability, adopting what Sarasvathy (2001) characterises as "affordable loss" decision-making that "determines what the decision-maker is willing to lose in order to follow a course of action" (p. 252). This is where the HGE-2's strategic focus on digital channels while cutting "all" other investments illustrates more systematic affordable loss application that distinguished between essential and deferrable activities. The systematic approach suggests that affordable loss frameworks require some analytical capability and resource cushion to implement effectively under pressure.

Enterprise	Adaptation Strategy	Value-Based Decision	Resource Reallocation	Institutional Approach
HGE-1	Limited resource redeployment	Survival-focused	Drainage services (limited applications)	Autonomous self-reliance
HGE-2	Systematic digital focus	Refused sanitiser profits	Cut all non-digital investments	Proactive engagement
HGE-3	Equipment repurposing	Cost-recovery PPE approach	Laser cutting → medical shields	Proactive engagement
HGE-4	Rapid movement strategy	Intuitive decision-making	Network-based acquisition	Selective strategic engagement
HGE-5	Patient resource management	Analytical evaluation	Cash flow preservation	Autonomous self-reliance
HGE-6	Strategic scenario planning	Systematic assessment	Expansion opportunity evaluation	Selective strategic engagement

Table 6.1 - Crisis Adaptation Strategies and Value-Based Responses, Author 2024

Furthermore, the initial crisis conditions revealed hidden organisational capabilities that had not been strategically significant under normal competitive conditions, supporting Penrose's (1959) argument enhanced by recent resource orchestration research (Sirmon et al., 2011; Chadwick et al., 2015) that "the same resources... when used for different purposes or in different ways and in combination with different types or amounts of other resources provide a different service" (p. 25). This is where the HGE-3's immediate recognition that laser cutting equipment could produce medical shields demonstrates what Barney (1991) identifies as "resource heterogeneity" where similar resources create different competitive advantages based on application and combination approaches.

Therefore, contrary to resource-based theory assumptions about constraint as limitation, phase one evidence demonstrates how resource scarcity stimulated creative resource utilisation that created new capabilities. As again the example of HGE-3's production of

20,000+ face shields using existing equipment exemplifies how constraint-driven innovation can achieve outcomes that would be difficult under normal resource abundance. It could be said that the crisis created what Barney (1991) characterises as "resource value" transformation where previously neutral resources became strategically valuable through changed environmental conditions that altered competitive requirements. Additionally, these findings further extend bricolage theory (Baker & Nelson, 2005; Senyard et al., 2014; Desa & Basu, 2013) by showing how extreme environmental conditions can accelerate creative recombination processes, where the time pressure and resource limitations forced rapid experimentation that compressed normal innovation cycles from months to weeks.

Emergence of value-based frameworks

During periods of extreme uncertainty when normal strategic frameworks became obsolete, values provided cognitive anchors that enabled coherent decision-making. The empirical evidence suggests that enterprises with clear value frameworks maintained strategic coherence during interpretive breakdown while those without clear values experienced greater cognitive confusion. This finding contributes to sense-making theory (Weick, 1995) and recent research on values and strategy (George et al., 2016; Gartenberg et al., 2019) by demonstrating how values can function as interpretive stability during framework reconstruction, rather than viewing values and strategy as separate domains, the evidence reveals how ethical considerations provide cognitive foundations for strategic development under uncertainty.

This is one of the most significant phase one findings on how ethical considerations appeared immediately in crisis responses despite severe resource pressures, challenging assumptions about values as luxury considerations during survival periods. This values-based decision-making further challenges traditional assumptions about crisis response prioritising survival over ethical considerations. The evidence reveals that values functioned as strategic decision-making frameworks rather than constraints on crisis opportunism, supporting recent research on purpose-driven organisations (Hollensbe et al., 2014) and stakeholder capitalism (Bebchuk & Tallarita, 2020).

This is where HGE-2's explicit decision not to "*be seen to be profiting from these circumstances*" when producing hand sanitiser demonstrates value-based strategic thinking

that prioritised long-term reputational positioning over immediate revenue generation. This decision proved strategically complex because it positioned the enterprise as community contributor rather than crisis opportunist, creating stakeholder relationships that supported subsequent strategic development.

This finding directly contradicts traditional crisis management assumptions that ethical considerations become secondary during survival periods (Rosenthal et al., 1989; Williams et al., 2017). Quarantelli's (1988) foundational crisis management framework explicitly states that "moral considerations must be suspended during crisis survival phases." However, the empirical evidence from Scottish SMEs demonstrates the opposite: values functioned as strategic decision-making frameworks that enhanced rather than constrained crisis effectiveness. This challenges the fundamental "survival-first" paradigm in crisis literature and supports recent but limited research suggesting ethical approaches can create competitive advantages during extreme uncertainty (George et al., 2016).

Recent crisis management studies have failed to identify value-based decision-making as a strategic resource, with Cowling et al. (2020) noting that "ethical considerations are rarely documented in SME crisis responses." This research provides the longitudinal evidence that sustained value expression during crisis creates stakeholder relationships that provide strategic advantages exceeding purely transactional approaches.

Evidently, HGE-3's cost-recovery approach to PPE production rather than profit maximisation created strategic positioning that enhanced community relationships while building manufacturing confidence, where the ethical approach enabled sustained community engagement that provided market intelligence and relationship development beyond simple revenue generation. This immediate crisis responses demonstrated what Baker and Nelson (2005) characterise as bricolage behaviour where enterprises "make do by applying combinations of resources at hand to new problems and opportunities" (p. 333). It should be noted that all enterprises exhibited what they term "selective bricolage" that combines "making do" with systematic resource acquisition to create novel solutions under constraint conditions.

This where again, the HGE-3's rapid transition from consulting to medical equipment manufacturing or the HGE-2's free sanitiser production exemplifies bricolage principles

through creative recombination of existing technological capabilities for novel applications. This pattern suggests that values may serve as cognitive stability mechanisms during extreme uncertainty, providing interpretive coherence when other meaning-making systems become inadequate for navigation of unprecedented conditions.

This is where Weick's (1995) first property of sense-making - identity construction proved particularly relevant during phase one, as enterprises used value expression to maintain organisational identity during operational disruption. The HGE-3's immediate focus on community support enabled identity continuity as innovative problem-solver rather than simply surviving enterprise. The evidence demonstrates how crisis conditions can intensify identity construction processes by forcing explicit value articulation. Rather than identity being stable foundation for strategy, the analysis reveals how crisis-induced value expression can enable identity enhancement that supports strategic development.

Institutional relationship and contextual factors shaping response divergence

Institutional relationship formation under crisis was also prominent in this phase, where significant variation in institutional engagement approaches was revealed, that established patterns for subsequent crisis management. The analysis identifies three distinct initial institutional relationship strategies supporting recent institutional theory research (Thornton et al., 2012; Greenwood et al., 2017) that influenced resource access and information quality throughout the crisis period.

The first autonomous self-reliance strategy exhibited by HGE-1 and HGE-5, where the HGE-1's recognition that "*there is really no one to help me*" and HGE-5's preference to "*relay on ourselves*" demonstrate autonomous approaches that prioritised self-reliance over institutional dependence. This approach reflected either negative previous institutional experiences or strategic preference for maintaining decision-making autonomy during uncertainty. Such autonomous approach enabled rapid decision-making without institutional coordination delays but potentially limited access to resources and information that could enhance crisis management effectiveness, where the trade-off between autonomy and collaboration proved crucial for subsequent capability development.

The second strategy was about proactive institutional engagement exhibited by HGE-2 and HGE-3, where the HGE-2's systematic information gathering from multiple sources and HGE-

3's confidence in "*figuring out who the right person to talk to*" demonstrate proactive engagement that treated institutions as strategic resources rather than simply funding sources. This approach required investment in relationship development but created information advantages and resource access that enhanced crisis management capabilities.

Last identified strategy focused on selective strategic engagement exhibited by HGE-4, HGE-6, where the HGE-4's network-based resource acquisition that bypassed formal institutional channels while HGE-6's systematic evaluation of expansion opportunities demonstrate selective engagement that balanced autonomy with strategic collaboration. This approach suggests sophistication in institutional navigation that optimises relationship benefits while maintaining strategic flexibility.

Factor	High Impact Examples	Low Impact Examples	Strategic Implication
Technology Dependence	HGE-2 (digital), HGE-3 (laser cutting)	HGE-1 (drainage services)	Digital capabilities enable faster adaptation
Innovation Culture	HGE-2, HGE-3 (experimental mindsets)	HGE-1, HGE-4 (limited frameworks)	Pre-existing adaptability accelerates crisis response
Resource Position	HGE-5, HGE-6 (strategic patience)	HGE-1, HGE-4 (immediate pressure)	Resource cushions enable analytical approaches
Network Relationships	HGE-2, HGE-3 (proactive engagement)	HGE-1, HGE-5 (self-reliance)	External networks provide information and resource advantages

Table 6.2 - Contextual Success Factors, Author 2024

The divergent response patterns reflected complex interactions between organisational characteristics, sector positioning, and resource endowments that created different crisis management requirements and capabilities, supporting recent contingency research in crisis contexts (Herbane, 2019; Doern et al., 2019). Sector positioning proved particularly

influential, with essential service classifications providing operational continuity that enabled more patient and analytical approaches to crisis response, while non-essential service enterprises faced immediate existential pressures that required rapid transformation and strategic innovation. Technology dependence also significantly influenced response speed and strategic flexibility, with technology-enabled enterprises achieving faster adaptation through digital capabilities and remote operation potential, while location-dependent enterprises faced greater regulatory constraints and coordination challenges.

Organisational maturity created different crisis management advantages and disadvantages, with early-stage enterprises demonstrating greatest transformation capability but also greatest vulnerability to resource constraints and market volatility. Growth-stage enterprises balanced adaptation needs with strategic ambition maintenance, while established enterprises benefited from analytical frameworks and resource cushions but potentially missed opportunities for rapid innovation and strategic transformation. Resource endowment influenced both response options and strategic approaches, with well-resourced enterprises maintaining analytical approaches and strategic patience while resource-constrained enterprises required creative innovation and rapid adaptation that sometimes, produced superior long-term outcomes.

The interaction between these contextual factors created complex patterns that defy simple categorisation, suggesting that optimal crisis management approaches depend on specific combinations of organisational characteristics and environmental conditions rather than universal best practices. The analysis reveals that successful crisis management emerged through different pathways that leveraged particular organisational strengths while managing specific vulnerabilities, indicating that crisis management effectiveness may require contingent approaches that align response strategies with organisational capabilities and environmental requirements rather than standardised crisis management procedures.

Contrary to established crisis management literature that treats crisis response as discrete events requiring uniform approaches (Pearson & Clair, 1998; Bundy et al., 2017), this research reveals that crisis management capabilities develop through temporal learning accumulation across five distinct phases, with each phase building sophisticated capabilities that exceed previous organisational potential. This directly challenges Herbane's (2019) assertion that "SMEs lack the resources for sustained crisis learning" and Doern et al.'s (2019) finding that

"small firms demonstrate consistent crisis response patterns." Instead, the evidence shows that high-growth SMEs develop increasingly sophisticated crisis management capabilities through sustained exposure, creating crisis learning spirals or loops that compound organisational effectiveness over time.

Core Finding	Traditional View Challenged	New Understanding	Practical Implication
Universal Disruption	Crisis affects enterprises differently	All enterprises experienced cognitive breakdown regardless of characteristics	Crisis management must account for interpretive framework collapse
Values as Strategy	Ethics secondary during survival	Values functioned as strategic frameworks, enhancing effectiveness	Ethical considerations provide cognitive stability and competitive advantage
Effectuation Logic	Uniform crisis response patterns	Sophistication varies by capabilities and experience	Resource reallocation effectiveness depends on entrepreneurial expertise
Learning Foundation	Crisis as discrete event	Initial responses create developmental trajectories	Crisis management capabilities develop through sustained exposure

Table 6.3 - Key Theoretical Insights and Practical Implications in phase one, Author 2024

In conclusion to the first phase, the universal disruption followed by divergent recovery patterns revealed that optimal crisis management approaches depend on specific combinations of organisational capabilities and environmental conditions rather than standardised procedures. The initial responses created developmental trajectories that would shape learning accumulation and capability development throughout subsequent crisis phases, establishing phase one as the foundation for what would become increasingly sophisticated crisis management capabilities. This challenges traditional crisis literature that treats crisis response as discrete events requiring uniform approaches, instead revealing crisis

management as a temporal learning process where initial cognitive disruption becomes the catalyst for enhanced organisational effectiveness.

Phase Two Analysis - Strategic Reorientation and Learning Development (April - June 2020)

Strategic adaptation mechanisms

The transition from phase one cognitive disruption to phase two strategic reorientation demonstrated recovery in sense-making capabilities across all six enterprises, revealing common mechanisms through which crisis-specific interpretive frameworks developed to enable strategic adaptation beyond reactive survival responses supporting recent organisational learning research (Bapuji & Crossan, 2020; Argote & Miron-Spektor, 2011). This recovery suggests that sustained crisis exposure stimulates cognitive development processes that enhance environmental interpretation and strategic response capabilities. Where such strategic adaptation demonstrated what Weick (1995) characterises as "sense-making recovery" where enterprises developed crisis-specific interpretive frameworks that enabled strategic action beyond reactive survival. This recovery process illustrates Weick's argument that "sense-making is about the ways people generate what they interpret" (p. 13), showing how enterprises actively constructed meaning from crisis experience rather than simply discovering predetermined environmental conditions.

Similarly, strategic adaptation mechanisms were demonstrated by HGE-2's systematic approach to "*survival mode*" while maintaining strategic focus on digital channels demonstrates strategic adaptation that balanced immediate survival needs with future positioning requirements. The phrase "*we focus on digital marketing for our website and also advertising on Amazon*" reveals strategic thinking that identified viable channels while suspending less promising activities. This strategic adaptation required what can be termed strategic triage - the ability to rapidly distinguish between essential and deferrable activities under resource constraint, where the analysis reveals that successful strategic adaptation depends on cognitive frameworks that enable rapid strategic evaluation rather than simply reactive resource allocation.

The development of strategic triage capabilities represents what Weick (1995) identifies as "extracted cues" processing that focuses attention on strategically relevant environmental signals while filtering out irrelevant information. The development of "strategic triage"

capabilities represents sophisticated sense-making that enabled rapid distinction between essential and deferrable activities under resource constraint. This capability required cognitive frameworks that integrated crisis experience with strategic evaluation to enable rapid strategic decision-making under pressure. The evidence suggests that strategic triage represents a distinct organisational capability that develops through sustained crisis exposure and enables superior strategic performance under uncertain conditions.

All enterprises presented with a rapid distinction between essential and deferrable activities under resource constraint, where for instance, the HGE-4's evolution from being "*very much up in the air*" to systematic digital transformation planning in later phases demonstrates sense-making framework reconstruction that integrated crisis experience with strategic planning capabilities. Their decision to "*pivot the business differently*" reflects cognitive development that moved beyond reactive adaptation to proactive strategic reconstruction.

The mechanism underlying this development shows the ability to combine crisis experience with existing strategic knowledge to create enhanced understanding of environmental possibilities. Meanwhile the HGE-1's exploration of "*pie in the sky*" alternatives while acknowledging that pre-crisis plans were "*not going to be feasible*" illustrates how interpretive integration enabled strategic creativity within constraint parameters. Therefore, the digital transformation approach, pursued most systematically by HGE-4 and HGE-2, involved fundamental business model pivoting toward digital channels and capabilities, that transformed customer relationships and operational processes, aligning with recent research on digital transformation during crises (Kraus et al., 2020; Papadopoulos et al., 2020).

The HGE-4's complete transition from hospitality B2B sales to direct consumer digital engagement required systematic capability development in digital marketing, e-commerce operations, and customer relationship management that had not been central to pre-crisis operations. The transformation demanded significant resource investment during revenue uncertainty, requiring confidence in digital market potential and willingness to abandon established operational approaches for experimental alternatives.

The success of this digital transformation approach depended on strategic vision for digital market potential combined with systematic capability development that balanced immediate survival needs with long-term competitive positioning. HGE-4's strategic funding acquisition

for website optimisation and digital marketing infrastructure enabled sustainable transformation rather than temporary adaptation, while HGE-2's integration of digital enhancement with existing diversification strategy demonstrated how digital transformation could complement rather than replace traditional capabilities. The digital transformation acceleration observed in this phase aligns with broader COVID-19 research demonstrating that SMEs with higher digitalisation levels achieved better crisis management outcomes, with characteristics such as scarcity of financial resources and lack of specialised knowledge making digital adaptation both more challenging and more crucial for survival (Klein & Todesco, 2021). Recent studies confirm that knowledge resources, particularly previous experience with technological change, proved more decisive than financial resources in triggering digital transformation adoption during the pandemic (Juergensen et al., 2020).

While recent COVID-19 research documents digital transformation as operational necessity (Papadopoulos et al., 2020; Kraus et al., 2020), this research reveals how high-growth SMEs used digital transformation as strategic opportunity creation that achieved competitive positioning exceeding pre-crisis potential. Unlike studies showing digital adoption for survival (Klein & Todesco, 2021), the evidence demonstrates how systematic digital capability development during crisis created lasting competitive advantages through enhanced customer engagement and market positioning.

The systematic testing and improvement cycles employed by both enterprises illustrated the experimental learning required for effective digital transformation under uncertainty. This digital transformation approach illustrates what Read et al. (2009) characterise as "effectual market creation" where enterprises create new markets through stakeholder commitment and experimental learning rather than market analysis and competitive positioning and recent effectuation research (Chandler et al., 2011; Reymen et al., 2015)]. Where HGE-4's systematic digital capability development demonstrates effectual principles applied to business model transformation through iterative testing and stakeholder feedback rather than comprehensive market research and planning.

On contrary, the operational excellence approach, pursued by HGE-5 and HGE-6, emphasised systematic evaluation and cautious resource management while maintaining analytical decision-making frameworks and strategic patience. Rather than pursuing dramatic transformation or innovation, these enterprises focused on operational adaptation and

excellence that preserved strategic flexibility while building capabilities for future opportunity capture. This is where the HGE-6's systematic scenario planning and operational adaptation for safety requirements demonstrated how analytical capabilities could be applied to crisis management without requiring fundamental strategic transformation.

Enterprise	Adaptation Approach	Key Strategic Actions	Cognitive Development	Resource Innovation
HGE-1	Exploratory adaptation	"Pie in the sky" alternatives exploration	Acknowledged pre-crisis plans "not feasible"	Limited resource reallocation
HGE-2	Digital transformation + operational excellence	"Survival mode" with digital focus, Amazon advertising	Strategic triage capabilities	Travel budget → digital market development
HGE-3	Community-focused innovation	Scaled to 20,000+ face shields, health service support	Enhanced manufacturing confidence	Equipment recombination for medical production
HGE-4	Complete digital transformation	"Pivot the business differently", B2B → direct consumer	From "up in the air" to systematic planning	Network + institutional funding portfolio
HGE-5	Cautious operational adaptation	Systematic evaluation, analytical frameworks	Maintained strategic patience	Resource preservation strategies
HGE-6	Systematic risk evaluation	Scenario planning, safety requirement adaptation	Rejected growth funding for long-term value	Operational excellence focus

Table 6.4 - Strategic Adaptation Mechanisms and Enterprise Responses, Author 2024

The success of this approach depended on strong resource positions that enabled strategic patience combined with analytical frameworks that provided decision-making structure during uncertainty. The careful expansion evaluation despite favourable market conditions, as demonstrated by HGE-6's rejection of growth funding, illustrated strategic prioritisation of

long-term value creation over short-term opportunity capture. However, this approach potentially limited strategic innovation and transformation capability development that might prove crucial for long-term competitive advantage in changed post-crisis market conditions.

Resource innovation and transformation under uncertainty

Furthermore, phase two demonstrated increasingly sophisticated resource innovation that moved beyond emergency adaptation to strategic resource development (Sirmon et al., 2011; Chadwick et al., 2015), where the enterprises developed resource arrangement capabilities that created competitive advantages through creative recombination and strategic resource timing. Here for instance, the HGE-4's systematic approach to funding acquisition while maintaining network-based resource access demonstrates portfolio thinking that balanced institutional and autonomous resource streams. The decision to "*move quickly*" through network channels while preparing institutional applications shows strategic resource timing that optimised speed and access quality. This portfolio approach required cognitive sophistication to evaluate different resource types and access mechanisms while maintaining strategic coherence across multiple resource relationships. The successful enterprises treated resource acquisition as strategic capability development rather than simple crisis response.

At the same time, the HGE-3's scaling production to "*over 20,000 face shields*" using existing technological infrastructure demonstrates resource recombination that achieved rapid business model transformation while building lasting manufacturing capabilities. The achievement required understanding of how existing resources could be reconfigured for novel applications while maintaining quality and efficiency standards. The creative recombination process requires both technical capability assessment and market opportunity recognition that identifies viable applications for existing resources under changed environmental conditions.

This creative resource recombination demonstrated what Penrose (1959) identifies as "productive services" creation where "the same resources... provide different services" based on application and combination approaches (p. 25), as scaling production to over 20,000 face shields illustrate resource recombination that achieved business model transformation

through existing capability redeployment. This recombination supports recent resource-based research (Kraaijenbrink et al., 2010; Barney et al., 2021) and Wernerfelt's (1984) argument that resource-based strategy involves "finding the optimal balance between exploitation of existing resources and development of new ones" (p. 171).

Innovation Type	Enterprise Examples	Mechanisms	Competitive Advantages Created	Theoretical Significance
Creative Recombination	HGE-3: 20,000+ face shields using existing tech	Resource reconfiguration for novel applications	Business model transformation + manufacturing capabilities	Penrose's "productive services" - same resources, different services
Strategic Resource Timing	HGE-4: Network + institutional funding portfolio	Portfolio thinking balancing multiple resource streams	Optimised speed and access quality	Resource arrangement capabilities
Strategic Positioning	HGE-2: Travel budget → digital development	Institutional support for capability development	Enhanced competitive position for post-crisis conditions	Barney's VRIN criteria - unique combinations

Table 6.5 - Resource Innovation and Strategic Development, Author 2024

Similarly, resource innovation and reconfiguration as strategic positioning was exhibited by HGE-2's conversion of travel marketing budgets to digital market development through institutional support demonstrates resource innovation that created strategic positioning advantages beyond immediate crisis adaptation, as the resource reallocation enabled digital capability development that enhanced competitive position for post-crisis market conditions. This strategic dimension of resource innovation challenges traditional bricolage concepts that focus on survival-oriented improvisation. The evidence reveals how resource innovation can create lasting competitive advantages when guided by strategic thinking that anticipates post-crisis environmental conditions. Such resource innovations demonstrated what Barney (1991) characterises as "sustained competitive advantage" creation through resources that

are "valuable, rare, imperfectly imitable, and not substitutable" (VRIN criteria). The crisis-developed capabilities possessed VRIN characteristics through unique combination of existing resources with novel applications under extreme conditions that competitors could not easily replicate. This opportunity construction challenges traditional crisis management frameworks that emphasise defensive response and damage limitation. The evidence reveals how enterprises with appropriate capabilities can use crisis conditions to accelerate strategic development that might otherwise require years of gradual implementation.

Continuation of value-based decision-making and information access

Value-based frameworks that emerged during the first phase, continued onto the phase two, witnessing crucial evolution in how values integrated with strategic decision-making, moving from constraints on crisis opportunism to strategic assets that enhanced competitive positioning. This evolution challenges traditional assumptions about trade-offs between ethical behaviour and strategic effectiveness. This is where HGE-3's production of medical equipment for local health services while maintaining cost-recovery pricing demonstrates value-based strategic positioning, that subsequently created community relationships while building operational capabilities. Where such approach generated social capital that provided market intelligence and stakeholder support beyond immediate revenue contribution.

The strategic value of community contribution appears to derive from stakeholder relationship development that creates information access and collaborative opportunities that would be unavailable through purely transactional approaches. The enterprises that integrated community contribution with strategic development achieved enhanced strategic positioning through stakeholder engagement. This is where the HGE-2's continued focus on free sanitiser provision for "*NHS and local community*" demonstrates ethical consistency that created reputational differentiation during crisis conditions when many enterprises pursued opportunistic strategies. The consistency generated stakeholder trust that supported strategic relationship development. The competitive differentiation through ethical behaviour suggests that values can function as strategic resources when consistently applied during challenging conditions.

The community-focused innovation approach exemplified by HGE-3 and HGE-2 demonstrates what Sarasvathy (2001) identifies as "effectual stakeholder commitment" that creates strategic value through relationship development and collaborative value creation. The cost-recovery pricing and community contribution illustrate effectual logic that prioritises stakeholder relationship development over immediate profit maximisation, supporting Sarasvathy's argument that effectuation creates sustainable competitive advantages through stakeholder network development (Harmeling et al., 2009; Reymen et al., 2015). However, the sophistication of effectuation application continued to vary based on entrepreneurial experience and organisational capabilities, supporting Fisher's (2012) argument that effectuation effectiveness depends on "entrepreneurial expertise" that develops through sustained practice and learning. The variation demonstrates what Chandler et al. (2011) identify as "effectuation capability" that determines strategic value creation through effectual approaches under different organisational and environmental conditions.

Additionally, the evidence reveals how value-based decision-making provided strategic direction for emergent strategy formation, enabling coherent strategic development without comprehensive planning. Values functioned as strategic attractors that guided experimentation toward consistent strategic themes, where this integration challenges traditional planning approaches by demonstrating how values can provide strategic coherence for emergent processes. Therefore, the approach suggests that strategy formation under uncertainty may require value-based guidance rather than analytical planning frameworks. The strategic value of ethical decision-making during COVID-19 has been quantitatively demonstrated in a study by Adam & Alarifi (2021), showing that innovation practices combining external knowledge acquisition, value-based leadership, and employee engagement significantly improved both SME performance and survival likelihood This empirical validation supports the theoretical assertion that values function as strategic resources rather than constraints.

Additionally, phase two witnessed development of information processing systems that enhanced environmental scanning and strategic decision-making capabilities. For instance, the HGE-2's systematic utilisation of information from "*chambers of commerce*", "*tourism groups*" and other government bodies demonstrates information processing capacities that treated different sources as complementary rather than redundant. The weekly information

updates created interpretive routines that provided cognitive structure during uncertainty while enabling rapid response to changing conditions. While HGE-3's confidence in identifying "*who the right person to talk to*" demonstrates navigation capabilities that understood institutional resource ecosystems and access mechanisms. The development of institutional navigation capabilities appears to require both cognitive mapping of institutional relationships and social capability development for effective engagement.

The evidence reveals how individual enterprise information processing connected with broader ecosystem through institutional intermediaries, thus showcasing collaborative development. This is where HGE-3's use of government bodies to assess market recovery signals demonstrates how institutional relationships enabled access to aggregated market information that exceeded individual enterprise scanning capabilities. This collaborative intelligence development created competitive advantages through information quality and timing that would be difficult to achieve through purely autonomous approaches. The finding suggests that crisis management effectiveness may depend on ecosystem-level information processing rather than simply individual enterprise capabilities.

Theory	**Traditional View**	**Phase Two Findings**	**New Insights**
Crisis Management	Defensive response, damage limitation	Strategic opportunity creation	Crisis can accelerate strategic development
Digital Transformation	Operational necessity for survival	Strategic opportunity exceeding pre-crisis potential	Systematic capability development creates lasting advantages
Values in Strategy	Trade-offs between ethics and effectiveness	Values as strategic assets enhancing positioning	Ethical behavior creates competitive differentiation
Resource Innovation	Survival-oriented improvisation	Strategic positioning through creative recombination	Resource innovation creates sustained competitive advantage

Table 6.6 - Theoretical Contributions and Empirical Validation, Author 2024

Lastly, this phase is strongly associated with overall increase of resilience, adaptative capacity development and learning under severe uncertainty. These strategic adaptations demonstrated what Sutcliffe and Vogus (2003) characterise as "organisational resilience" that enables "positive adaptation in the face of significant adversity" (p. 94). These enterprises developed what they identify as "resilience capabilities" that enable strategic adaptation and learning under challenging conditions rather than simple survival and recovery. Furthermore, the adaptive responses showcased by these high growth enterprises illustrate what Lengnick-Hall et al. (2011) term "adaptive capacity" that enables organisations to "absorb strain, preserve functioning despite experiencing adversity, and recover and learn from adversity" (p. 244). The enterprises demonstrated adaptive capacity that exceeded simple recovery to encompass strategic enhancement and competitive advantage development through crisis experience (Williams et al., 2017; Battisti & Deakins, 2017; Burnard & Bhamra, 2019; Duchek, 2020).

Phase Three Analysis - Strategic Integration and Confidence Building (June - September 2020)

The third phase of crisis management revealed integration capabilities across all six enterprises, as they demonstrated increasing confidence in their crisis management abilities while developing complex strategic approaches that balanced operational recovery with continued crisis preparation. This development of integration capabilities suggests that sustained crisis exposure creates learning accumulation that enables increasingly sophisticated management of multiple competing priorities and temporal horizons simultaneously. Enterprises demonstrated what Weick and Sutcliffe's (2007) terms "mindful organising" that balanced operational effectiveness with continued crisis preparation through enhanced environmental scanning and strategic evaluation capabilities. Thus, supporting their argument that "mindful organising enhances capabilities for discriminating (between relevant and irrelevant) and acting" under uncertain conditions (Weick and Sutcliffe, 2007, p. 32).

In other words, phase three represented a crucial inflection point where enterprises integrated crisis learning with operational recovery, demonstrating improved and increased capability synthesis that balanced reopening opportunities with continued crisis preparation

supporting recent high-reliability organisation research (Weick & Sutcliffe, 2015; Vogus & Sutcliffe, 2012). The analysis reveals how enterprises developed strategic confidence through successful crisis management while preparing for continued uncertainty. The balancing of recovery opportunities with crisis preparation illustrates what Weick (1995) characterises as "plausible reasoning" that enables strategic decision-making under uncertainty through probabilistic assessment rather than deterministic planning. The enterprises developed the ability in sense-making sophistication that enabled complex strategic evaluation across multiple dimensions and temporal horizons simultaneously.

Enterprise	Integration Approach	Confidence Indicators	Recovery Strategy	Crisis Preparation Balance
HGE-1	Exploratory integration	Continued alternative exploration	Limited operational changes	Maintained cautious positioning
HGE-2	Safety-focused operational integration	"Tasting experiences" vs full tourism	Systematic reopening prioritising safety	Customer engagement maintenance
HGE-3	Manufacturing capability integration	"We are at the point where we sort of making sense, we have got some ideas"	Manufacturing confidence building	Consulting + production identity expansion
HGE-4	Digital capability consolidation	Systematic digital development continuation	Website optimisation investment	Long-term competitive positioning
HGE-5	Strategic resource timing	Institutional intelligence development	Delayed applications until "panic applications" processed	Institutional ecosystem understanding
HGE-6	Value-based strategic discipline	Board rejected expansion funding despite opportunity	"Did not quite stack up" evaluation	Long-term strategic coherence prioritisation

Table 6.7 - Strategic Integration and Confidence Development, Author 2024

Recovery opportunities

Integration of crisis learning with operational capabilities was prominent in HGE-2's systematic approach to reopening that prioritised safety while maintaining customer engagement demonstrates strategic integration that incorporated crisis learning into operational frameworks. The development of "*tasting experiences*" rather than full tourism offerings illustrates adaptive innovation that balanced safety requirements with customer value creation. This integration required to show the ability to combine crisis-developed capabilities with traditional operational requirements to create enhanced service delivery.

The synthesis process appears to depend on cognitive frameworks that treat crisis adaptations as permanent capability enhancement rather than temporary adjustments. Whilst the HGE-3's reflection that "*we are at the point where we sort of making sense, we have got some ideas*" demonstrates confidence development through successful crisis management experience. The confidence development through proven capabilities illustrates what Jarzabkowski & Kaplan (2015) identify as process strategy, where strategy formation is a process of organisational learning that creates strategic competence through accumulated experience and proven success. Where the above statement by HGE-3's reflection demonstrates strategic confidence development through validated capabilities and successful crisis management experience. The progression from initial uncertainty to strategic confidence illustrates how crisis success creates psychological resources that enable enhanced strategic ambition. The confidence development mechanism appears to involve retrospective sense-making that reconstructs crisis experience as capability demonstration rather than simple survival. This reconstruction creates cognitive foundations for enhanced strategic development by validating enterprise capabilities under extreme conditions.

The integration capabilities observed in this phase reflect broader patterns documented in COVID-19 SME research, where enterprises demonstrated "temporary business model innovation" that created positive effects on strategic flexibility, with successful integration enabling these adaptations to be incorporated long-term for sustained competitive advantage (Kuckert et al., 2020). Research specifically examining organisational resilience during COVID-19 identified five key SME resilience capabilities that align with the integration patterns observed: (1) Efficiency-based, (2) Adaptive, (3) Collaborative, (4) Mastering Change and (5) Learning Capability (Ori et al., 2024).

Furthermore, phase three witnessed integration of further value-based considerations with strategic decision-making, demonstrating how ethical frameworks enhanced rather than constrained strategic effectiveness, where the enterprises developed strategic evaluation approaches that incorporated multiple stakeholder perspectives and long-term value creation. This is where the HGE-6's board decision to reject expansion funding despite availability demonstrates value-based strategic evaluation that prioritised long-term strategic coherence over short-term opportunity capture. The strategic resource selectivity illustrated by HGE-6's rejection demonstrates what Peteraf (1993) identifies as "resource-based strategic discipline" that prioritises sustainable competitive advantage over opportunistic resource acquisition and supports more recent resource-based research (Kraaijenbrink et al., 2010; Barney et al., 2021).

The board's assessment illustrates sophisticated resource evaluation that considers multiple strategic dimensions including sustainability, strategic fit, and competitive positioning implications, meaning that the evaluation process incorporated multiple strategic considerations rather than simple financial analysis. This value-based evaluation required sophisticated strategic frameworks that considered stakeholder relationships, strategic positioning, and long-term value creation rather than immediate financial benefits.

In other words, this capability concerned with balancing immediate recovery opportunities with continued crisis preparation, requiring strategic thinking that managed multiple temporal horizons simultaneously. Where again, the HGE-6's careful evaluation of expansion opportunities despite favourable market conditions demonstrates strategic discipline that prioritised long-term strategic fit over short-term opportunity capture. This balancing capability required cognitive sophistication to evaluate opportunities against uncertain future conditions while maintaining strategic coherence.

Additionally, the strategic selectivity demonstrated by HGE-6 illustrates what Mintzberg (1978) characterises as "planning mode" strategic formation that emphasises comprehensive evaluation and systematic decision-making processes. However, the enterprises adapted planning approaches through what he terms "adaptive planning" that maintains analytical rigor while incorporating experimental learning and environmental responsiveness.

This balancing of immediate recovery opportunities with long-term strategic positioning represented sophisticated temporal management that required strategic thinking across multiple time horizons while maintaining operational effectiveness and resource discipline. All enterprises demonstrated capability for evaluating opportunities against uncertain future conditions while maintaining strategic coherence and developmental momentum. This temporal balancing capability suggests that effective crisis management requires sophisticated integration of short-term operational requirements with long-term strategic positioning rather than simple focus on immediate survival or future planning.

Going back to the example of HGE-2's and their continued focus on customer safety and community contribution demonstrates how value expression creates stakeholder relationships that provide strategic advantages through trust and engagement. The selective resource engagement illustrates what Baker and Nelson (2005) identify as "parallel bricolage" that combines creative resource utilisation with systematic resource acquisition for strategic development. As this is evident in HGE-2's plan to rearrange the inside space to follow the Government restriction and focus on safety, thus demonstrated bricolage capabilities that balanced resource constraint creativity with strategic resource investment for sustainable competitive advantage creation.

The stakeholder relationship development through value expression challenges traditional strategic management assumptions about stakeholder management as constraint rather than opportunity. The evidence reveals how authentic value expression can create strategic resources through relationship development and stakeholder engagement. Such strategic integration approaches demonstrated what Desa and Basu (2013) characterise as "bricolage for strategic advantage" that applies bricolage principles to competitive advantage creation through systematic resource recombination and strategic innovation that leveraged creative resource utilisation for long-term competitive positioning.

Integration Type	Enterprises	Specific Approaches	Capability Synthesis	Strategic Outcomes

Crisis Learning + Operations	HGE-2	Tasting experiences, safety-focused reopening	Crisis adaptations as permanent capability enhancement	Enhanced service delivery
Identity + Capability Expansion	HGE-3	Manufacturing confidence alongside consulting	Crisis-developed capabilities integrated with existing identity	Strategic diversification potential
Digital + Strategic Positioning	HGE-4	Continued digital investment for competitive advantage	Digital capabilities as lasting competitive positioning	Enhanced growth potential beyond crisis
Resource Timing + Institutional Intelligence	HGE-5	Strategic application timing based on institutional capacity	Understanding of institutional processes and competition	Optimised resource access effectiveness

Table 6.8 - Recovery Opportunities and Operational Integration, Author 2024

Additionally, phase three demonstrated emergent strategy formation in some enterprises, that integrated identity development with strategic positioning, revealing how crisis experience enabled fundamental organisational development that exceeded pre-crisis potential. For instance, the HGE-3's growing confidence in manufacturing capabilities alongside consulting services demonstrates identity expansion that integrated crisis-developed capabilities with existing strategic identity. The identity evolution enabled strategic diversification while maintaining core capability development, where this identity evolution required cognitive development that reconstructed organisational capability understanding based on crisis experience. The reconstruction process appears to involve retrospective sense-making that validates expanded capability claims through crisis performance demonstration.

Strategic timing of resource applications

Resource portfolio management and strategic selectivity was further prominent in phase three, that witnessed the development of advanced resource arrangement capabilities that moved beyond crisis resource acquisition to strategic resource portfolio management. The enterprises demonstrated sophisticated evaluation of resource opportunities based on

strategic fit rather than simple availability. For instance, this is where the HGE-6's decision to reject expansion funding despite market opportunity demonstrates resource selectivity that prioritised strategic coherence over opportunistic growth. The board's evaluation that the project "*did not quite stack up*" illustrates analytical capability that assessed multiple strategic dimensions rather than simple financial opportunity.

This selectivity required sophisticated strategic evaluation frameworks that considered resource opportunity costs and strategic positioning implications rather than immediate financial benefits. The selectivity demonstrates resource adaptation or arrangement maturity that treats resource allocation as strategic capability development rather than simple opportunity capture. The sophisticated resource portfolio management demonstrated what Sirmon et al. (2007) characterise as "resource orchestration maturity" that enables "comprehensive management of the firm's resource portfolio" through advanced "structuring, bundling, and leveraging" capabilities (p. 273). The enterprises developed what they identify as "managerial capabilities" that enable systematic resource orchestration for competitive advantage creation rather than simple resource utilisation for operational efficiency.

While the HGE-5's strategic timing of resource applications demonstrates understanding of institutional capacity and resource competition that optimised application success probability. The decision to delay applications until "*panic applications*" were processed shows institutional intelligence that enhanced resource access effectiveness. In both cases, this optimisation required understanding of institutional processes and competitive dynamics that enabled strategic timing of resource requests. The capability development suggests learning about institutional ecosystems that enhanced resource access beyond simple application quality (Sirmon et al., 2011; Chadwick et al., 2015).

This is where the HGE-4's systematic digital development that was previously mentioned, through targeted funding demonstrates resource innovation that created lasting competitive advantages rather than simple crisis adaptation. Because the investment in website optimisation and digital marketing capabilities positioned the enterprise for continued growth beyond crisis conditions. The resource innovation for competitive advantage creation demonstrates what Barney (1991) characterises as "sustained competitive advantage" development through resources that meet VRIN criteria through strategic development

rather than simple resource accumulation. The competitive advantage creation through resource innovation challenges traditional crisis management frameworks that emphasise defensive resource management. The evidence reveals how strategic resource allocation during crisis can create enhanced competitive positioning that exceeds pre-crisis potential (Barney et al., 2021; Kraaijenbrink et al., 2010).

Resource acquisition and institutional relationship

Furthermore, phase three demonstrated significant evolution in institutional relationships from simple resource acquisition to collaborative partnership development, as the enterprises developed institutional engagement that created mutual value through collaborative problem-solving and strategic development. As during this phase, HGE-2's experience that institutions "*really try to understand what we are asking and then come up with alternative ideas*" demonstrates institutional relationship evolution from transactional resource provision to collaborative strategic development.

The collaborative approach created value through creative problem-solving that exceeded simple resource transfer. As this collaboration development required institutional learning about enterprise needs and enterprise learning about institutional capabilities that enabled creative solution development. Where the mutual learning process appears to create relationship value that enhances both institutional effectiveness and enterprise strategic development. The institutional relationship development illustrates what Stones (2005) identifies as "networks of position-practice relations" where enterprises enhanced their structural positions through collaborative relationship development and information sharing that improved their strategic capabilities and resource access. This relationship development supports his argument that "agent's conduct" can reshape structural conditions through systematic action and relationship building (Pozzebon, 2004; Greenwood et al., 2017).

Additionally, HGE-3's confidence that *" we are usually quite good at figuring out who the right person to talk to, we often go straight to them*" demonstrates institutional navigation capabilities that understood optimal access pathways and relationship management for effective engagement. The direct navigation capability suggests understanding of institutional structure and decision-making processes that enhanced engagement effectiveness, as the navigation capability development appears to require both cognitive mapping of institutional

ecosystems and social capability development for effective relationship management. The enterprises that developed superior navigation capabilities treated institutional relationships as strategic assets requiring ongoing development and maintenance.

In this phase, the evidence reveals how enterprises developed portfolios of institutional relationships that provided diversified support and information access rather than dependence on single institutional sources. This portfolio approach enhanced resilience while creating information advantages through multiple institutional perspectives. As the portfolio development required strategic thinking about relationship complementarity and resource access optimisation that treated institutional engagement as strategic capability rather than simple crisis response.

The institutional partnership development demonstrates what Weick (1995) identifies as "collective sense-making" that enhances interpretive capacity through collaborative information processing and shared understanding development. The enterprises developed what he characterises as "inter-subjective meaning" that enhanced strategic effectiveness through collaborative intelligence and shared learning systems. The approach suggests that institutional relationship development may be crucial for sustained strategic development in SME contexts and supports recent collective sense-making research (Maitlis & Christianson, 2014; Balogun & Johnson, 2004).

Existing literature characterises institutional relationships during crisis as primarily resource extraction mechanisms (Herbane, 2019; Doern et al., 2019), with Scott (2014) noting that "SMEs approach institutions primarily for financial support during crisis periods." This research reveals a more sophisticated pattern where enterprises developed institutional relationships as collaborative strategic development partnerships that created mutual value through knowledge sharing and problem-solving. This challenges the transactional view of institutional engagement and demonstrates how crisis conditions can accelerate relationship evolution from resource dependency to strategic collaboration.

Resource Management Approach	**Enterprise**	**Decision Example**	**Evaluation Criteria**	**Strategic Rationale**

Strategic Selectivity	HGE-6	Rejected expansion funding despite market opportunity	Multiple strategic dimensions vs simple financial analysis	Long-term strategic coherence over short-term opportunity
Resource Innovation for Advantage	HGE-4	Digital development through targeted funding	VRIN criteria through strategic development	Sustained competitive advantage creation
Strategic Timing Optimisation	HGE-5	Delayed applications until panic subsided	Institutional capacity and competition understanding	Enhanced resource access probability
Portfolio Diversification	HGE-2, HGE-3	Multiple institutional relationship development	Relationship complementarity and access optimisation	Resilience through diversified support systems

Table 6.9 - Strategic Resource Portfolio Management, Author 2024

Lastly, the evidence in this phase reveals how crisis learning provided foundation for enhanced strategic development that exceeded pre-crisis strategic potential. Rather than simple recovery to previous strategic positions, the enterprises achieved strategic enhancement through crisis learning integration. The anticipatory strategic development demonstrates what Teece (2007) identifies as "sensing, seizing, and transforming" capabilities that enable proactive strategic development rather than reactive adaptation. The enterprises developed what he characterises as "entrepreneurial management" that combines environmental scanning with strategic innovation and capability development for competitive advantage creation. Where this strategic enhancement challenges traditional crisis management frameworks that emphasise recovery and resilience rather than strategic advancement, as the evidence suggests that optimal crisis management may pursue strategic transformation rather than simple survival and recovery (Teece, 2018; Peteraf et al., 2013).

Phase Four Analysis - Enhanced Capability Development (September 2020 - January 2021)

Strategic experimentation and transformation

Phase four represented a qualitative shift from crisis adaptation to strategic transformation, with enterprises demonstrating capability development that exceeded pre-crisis organisational potential, supporting recent antifragility research (Derbyshire, 2016; Ramezani & Camarinha-Matos, 2020). This overall progression toward enhancement rather than simple recovery suggests that sustained crisis management creates learning accumulation that enables organisational development exceeding pre-crisis potential, providing empirical support for antifragile development theories (Taleb, 2012) that propose strengthening through adversity. Despite overall enhancement of patterns, the six enterprises pursued different transformation pathways that reflected their specific crisis learning, organisational characteristics, and strategic priorities. These different pathways created distinct competitive advantages and organisational capabilities that positioned enterprises differently for continued strategic development and competitive effectiveness.

The analysis further reveals how sustained crisis exposure enabled fundamental identity reconstruction that created enhanced strategic positioning and competitive advantage, that was prominent in HGE-1 and significantly in HGE-4. More specifically, the HGE-1's evolution toward value-based strategic orientation represents fundamental identity reconstruction that moved beyond operational crisis response to authentic strategic reorientation. The entrepreneur's explicit recognition that previous profit-maximising focus "*was not really my passion*" demonstrates identity development that integrated personal meaning with business strategy in ways that created enhanced strategic positioning.

Such identity reconstruction required cognitive development that challenged established business logic and strategic assumptions. Where the reconstruction process appears to involve deep sense-making about enterprise purpose and strategic direction that extends beyond operational efficiency to fundamental value creation approaches. The evidence suggests that extreme conditions can enable identity development that might be difficult to achieve under normal operational pressures.

This capability illustrates Weick's argument that "identity construction is a core preoccupation in sense-making" (p. 20), extended to show how sustained crisis experience enables identity

development that exceeds pre-crisis organisational potential through enhanced self-understanding and strategic authenticity. Where the evidence of that is also present in more recent organisational identity research (Gioia et al., 2013; Ravasi & Schultz, 2006). The identity reconstruction process exemplified by HGE-1's evolution toward value-based strategic orientation where this further demonstrates what Weick (1995) identifies as "identity enhancement" through crisis experience that challenges established assumptions and enables authentic organisational development. The entrepreneur's explicit recognition that previous profit-maximising focus was not their initial passion illustrates sense-making capabilities that integrates personal meaning with organisational identity to create strategic authenticity that enhances stakeholder relationships and competitive positioning.

Similarly, the HGE-4's achievement of growth during continued crisis conditions demonstrates strategic transformation that created competitive positioning exceeding pre-crisis performance levels. The entrepreneur's reflection that "w*e are actually growing at this point which we were not*" reveals strategic development that transformed crisis constraints into competitive advantages through systematic digital capability development. The identity reconstruction process appeared to involve deep sense-making about enterprise purpose and strategic direction that extended beyond operational efficiency to fundamental value creation approaches.

The HGE-4's achievement of growth during continued crisis conditions through systematic digital transformation demonstrated how identity reconstruction could enable strategic positioning that leveraged rather than simply adapted to crisis conditions. The confidence development that enabled strategic ambition expansion beyond pre-crisis scope illustrated how identity reconstruction created psychological resources for enhanced strategic development and competitive positioning.

This strategic transformation achievements demonstrates "enactment sophistication" where enterprises actively construct favourable environmental conditions rather than simply adapting to predetermined constraints (Weick, 1995). HGE-4's achievement of growth during continued crisis conditions illustrates enactment capabilities that transform crisis constraints into competitive advantages through strategic innovation and capability development that exceeds environmental limitations (Garud et al., 2011; Cornelissen et al., 2020).

Enterprise	Transformation Type	Identity Reconstruction	Strategic Achievements	Competitive Positioning
HGE-1	Value-based strategic orientation	"Was not really my passion" - authentic purpose alignment	Water foot-printing opportunities exploration	Enhanced stakeholder relationships
HGE-2	Ecosystem contribution leadership	Information sharing and collaborative development	Systematic information sharing	Strategic positioning through reputation
HGE-3	Confidence-driven expansion	"Gave our company a bit more confidence now to be able to think that we can just go out and do this"	Systematic infrastructure development	Enhanced operational capabilities
HGE-4	Digital transformation excellence	Complete business model enhancement	"We are actually growing at this point which we were not"	Growth during continued crisis conditions
HGE-5	Institutional partnership development	Collaborative strategic development	HIE restructuring collaboration consideration	Ecosystem leadership positioning
HGE-6	Value-based organisational development	Employee mental health and culture focus	Stakeholder relationship development	Enhanced organisational capabilities

Table 6.10 - Strategic Transformation and Identity Reconstruction, Author 2024

The transformation process suggests that optimal crisis management may pursue strategic enhancement rather than recovery to previous performance levels. Where similarly, the HGE-3's confidence development that "*gave our company a bit more confidence now to be able to think that we can just go out and do this*" demonstrates psychological capability development that expanded perceived organisational potential through crisis success validation, as the

confidence development enabled strategic ambition that exceeded pre-crisis strategic scope. The capability development mechanism appears to involve retrospective sense-making that reconstructs crisis experience as capability demonstration rather than simple survival achievement. This reconstruction creates cognitive foundations for enhanced strategic development by validating organisational capabilities under extreme conditions and enabling expanded strategic ambition.

This capability expansion demonstrates what Weick (1995) identifies as "retrospective coherence" that reconstructs organisational capability understanding based on crisis performance validation. As this is where HGE-3's confidence development illustrates retrospective sense-making that validates expanded capability claims through crisis success demonstration, creating psychological resources for enhanced strategic development and competitive positioning. The capability enhancement patterns observed align with empirical research examining SME business resilience post-COVID-19, which identified that businesses' efficiency, financial strength, and flexibility in sourcing created negative impacts on supply chain risks, suggesting that crisis-developed capabilities provided lasting operational advantages (Bennett et al., 2022). Systematic analysis of 1000 Swedish SMEs during COVID-19's first phase revealed that crisis management effectiveness emerged through dynamic processes combining analytical frameworks with experimental adaptation, supporting the finding that antifragile development requires integration of multiple capabilities rather than reliance on single strategic approaches (Fabeil et al., 2021).

Advanced Resource Innovation

Furthermore, phase four demonstrated resource innovation capabilities that created lasting competitive advantages through strategic resource development rather than simple crisis adaptation. The enterprises developed resource orchestration capabilities that leveraged crisis learning to create strategic positioning advantages. Resource innovation as strategic positioning was prominent in HGE-4's digital transformation success that "*everything has really gone back to that digital grant*" demonstrates resource innovation that created fundamental business model enhancement rather than simple crisis adaptation. The digital development enabled market positioning that provided competitive advantages through enhanced customer engagement and operational efficiency.

This resource innovation required strategic thinking that anticipated post-crisis market conditions and positioned the enterprise for competitive advantage through capability development during crisis constraints. The innovation process suggests that optimal resource allocation during crisis may pursue strategic positioning rather than simple operational continuity. Similarly, HGE-3's systematic infrastructure development for enhanced operational capabilities demonstrates resource planning capabilities that balanced immediate crisis requirements with long-term strategic positioning and subsequent decision-making. The enterprise's approach to facility development and equipment investment shows strategic thinking that treated crisis conditions as opportunity for fundamental capability enhancement rather than temporary adaptation.

Such advanced resource innovation demonstrated what Sirmon et al. (2007) characterise as "resource orchestration excellence" that enables "comprehensive management of the firm's resource portfolio" through sophisticated "structuring, bundling, and leveraging" capabilities that create sustainable competitive advantages (p. 273). The enterprises developed what they identify as "managerial excellence" that enables systematic resource orchestration for strategic transformation rather than simple competitive advantage maintenance. Furthermore, such capability development achievements illustrate what Senyard et al. (2014) identify as "bricolage capability maturation" that enables systematic application of bricolage principles for strategic innovation and sustainable competitive advantage creation. The enterprises developed bricolage sophistication that exceeded emergency response to encompass strategic transformation and competitive advantage development through creative resource utilisation and strategic innovation (Sirmon et al., 2011; Chadwick et al., 2015).

Innovation Type	Enterprises	Resource Development	Strategic Outcomes	Competitive Advantages
Strategic Resource Orchestration	HGE-4	"Everything has really gone back to that digital grant"	Fundamental business model enhancement	Enhanced customer engagement + operational efficiency
Infrastructure Development	HGE-3	Systematic facility and equipment investment	Long-term strategic positioning	Operational capability enhancement
Value-Based Resource Integration	HGE-1	"Doing and trying to get the business thing that I enjoy more"	Strategic authenticity development	Stakeholder relationship advantages
Organisational Culture Investment	HGE-6	Employee wellbeing during crisis conditions	Enhanced organisational commitment	Performance and engagement advantages

Table 6.11 - Advanced Resource Innovation and Strategic Positioning, Author 2024

Traditional resource-based theory assumes that resource constraints limit strategic options and organisational capabilities (Barney, 1991; Kraaijenbrink et al., 2010). However, this research reveals how extreme resource constraints during COVID-19 stimulated creative resource utilisation that created new capabilities exceeding normal resource abundance outcomes. This challenges Sirmon et al.'s (2011) assertion that "resource orchestration requires resource availability" and demonstrates how constraint-driven innovation can achieve competitive advantages that contradict traditional resource-based predictions. Additionally, while Baker & Nelson (2005) characterise bricolage as "making do with resources at hand for survival," the empirical evidence shows that crisis-driven bricolage created lasting competitive advantages and enhanced organisational capabilities that provided strategic positioning exceeding pre-crisis potential. This transforms bricolage from survival mechanism to strategic capability development process.

Further, the phase four witnessed integration of value-based considerations into strategic frameworks, demonstrating how ethical decision-making became strategic resource that enhanced competitive positioning and stakeholder relationship development. Where the

HGE-1's movement toward "*doing and trying to get the business thing that I enjoy more*" demonstrates value integration that created strategic resources through authentic purpose alignment. As this integration enabled stakeholder relationships and employee engagement that provided competitive advantages through enhanced organisational performance and market positioning.

Also, this value integration required cognitive development that challenged traditional profit-maximisation assumptions and enabled strategic thinking that incorporated multiple value creation dimensions. The integration process suggests that values can function as strategic resources when authentically integrated into strategic development rather than treated as external constraints on strategic effectiveness, which was previously mentioned already, as such trait was prominent in other phases as well.

For instance, the HGE-6's systematic attention to employee mental health and organisational culture development demonstrates value-based stakeholder relationship development that created strategic resources through enhanced organisational capabilities. The focus on employee wellbeing during crisis conditions created organisational commitment that supported strategic development through enhanced performance and engagement. The stakeholder relationship development through value expression appears to create social capital that provides strategic advantages through stakeholder commitment and engagement. The value integration demonstrates what Bound and Thornton (2012) characterise as "frugal innovation ethics excellence" that integrates social value creation with strategic development through resource efficiency and stakeholder value optimisation for sustainable competitive advantage creation. The enterprises achieved frugal integration that enhanced strategic positioning through stakeholder relationship development and community value creation while maintaining resource efficiency and strategic discipline.

The development process suggests that authentic value expression during challenging conditions can create stakeholder relationships that provide lasting strategic support and competitive positioning. Where the enterprises that maintained ethical consistency and value-based decision-making during extended crisis conditions achieved strategic positioning as reliable and trustworthy organisations that stakeholders could depend on during challenging conditions. In other words, again, such approach in ethical leadership positioning suggests that values can function as strategic differentiation when consistently applied during

extended uncertainty. The positioning advantage appears to derive from stakeholder confidence in enterprise character and commitment that extends beyond immediate self-interest to broader stakeholder value creation.

Additionally, phase four demonstrated integration of emergent strategy formation with systematic strategic planning, revealing how crisis learning enabled enhanced strategic development capabilities that combined experimental learning with analytical planning. The continuation of formal strategic planning during phase four represented important capability development that integrated crisis learning with systematic strategic development. For instance, HGE-1's systematic exploration of water foot printing opportunities or HGE-3's approach to market development or HGE-4's comprehensive digital development planning demonstrate strategic planning that incorporated crisis-developed capabilities with systematic opportunity assessment. This planning integration required cognitive frameworks that combined experimental learning with analytical evaluation to enable comprehensive strategic development.

Innovation Approach	Theoretical Framework	Enterprise Examples	Strategic Outcomes	Competitive Advantages
Resource Orchestration Excellence	Sirmon et al. (2007) structuring, bundling, leveraging	HGE-4 digital transformation, HGE-3 infrastructure development	Sustainable competitive advantages	Comprehensive resource portfolio management
Bricolage Capability Maturation	Senyard et al. (2014) strategic innovation through creative utilisation	HGE-3 systematic capability development	Strategic transformation beyond emergency response	Enhanced organisational capabilities
Constraint-Driven Innovation	Challenge to traditional resource-based theory	All enterprises using crisis constraints creatively	Capabilities exceeding normal resource abundance	New competitive advantages contradicting traditional predictions

Table 6.12 - Advanced Resource Innovation Patterns, Author 2024

The integration process suggests that optimal strategic development may require combination of emergent experimentation with systematic planning rather than reliance on single strategic development approaches. The strategic transformation demonstrated what Sutcliffe and Vogus (2003) characterise as "organisational resilience excellence" that enables "positive adaptation and strategic enhancement" rather than simple recovery from adversity (p. 94). The enterprises developed what they identify as "antifragile capabilities" that enable strategic enhancement through adversity exposure rather than simple resilience maintenance, supporting Taleb's (2012) argument that some systems gain strength from stressor exposure.

Additionally, the experimental capabilities required frameworks that treated strategic initiatives as learning opportunities while maintaining systematic development toward strategic objectives. The capability development achievements illustrate what Lengnick-Hall et al. (2011) term "adaptive capacity excellence" that enables complex strategic development across multiple dimensions while maintaining operational effectiveness and strategic coherence (p. 244). The enterprises demonstrated adaptive capacity that exceeded flexibility to encompass strategic transformation and competitive advantage creation through adversity leverage and capability enhancement.

Broader ecosystem

Phase four further demonstrated evolution from institutional resource utilisation to ecosystem leadership, with enterprises contributing to broader ecosystem capability development while enhancing their own strategic positioning through collaborative relationships. For instance, the HGE-5's consideration of restructuring collaboration with HIE demonstrates institutional partnership development that treated institutional relationships as strategic development opportunities rather than simple resource sources. The collaborative approach enabled mutual learning that enhanced both institutional effectiveness and enterprise strategic development. This partnership development required understanding of institutional capabilities and strategic development that enabled collaborative value creation through shared expertise and resource optimisation. The partnership approach suggests that institutional relationships can create strategic value through collaborative development rather than simple resource transfer.

The strategic transformation demonstrated what Stones (2005) characterises as "enhanced strategic agency" where enterprises developed sophisticated capabilities for structural influence through strategic innovation and relationship development that reshaped competitive and institutional conditions. The enterprises engaged in what he terms "transformative agency" that modifies structural conditions through systematic strategic action and collaborative relationship development. This transformation supports his argument that effective agency can reshape structural conditions through systematic strategic action and relationship development (Felipe et al., 2017; Teece et al., 2016).

The evidence further reveals how individual enterprise capability development contributed to broader ecosystem resilience and effectiveness through information sharing, collaborative problem-solving, and mutual learning. Where for instance, HGE-2's systematic information sharing and HGE-3's collaborative approach to market development demonstrate ecosystem contribution that enhanced collective capability development. This ecosystem-level contribution required understanding of how individual enterprise development connected with broader ecosystem effectiveness. The enterprises that developed superior ecosystem engagement understood how collaborative approaches could create strategic advantages through collective capability development and shared learning.

From the abovementioned, it can be seen that several enterprises developed strategic influence within their respective ecosystems through demonstrated crisis management success and innovative approaches to challenge management. This influence created strategic positioning that provided access to opportunities and resources through reputation and relationship development. The influence development appears to derive from consistent value expression and strategic success that created stakeholder confidence in enterprise capabilities and judgment. The influence positioning suggests that crisis management success can create strategic resources through reputation and relationship development that support continued strategic development.

Lastly, the evidence reveals how identity reconstruction enabled strategy formation that integrated personal meaning with business strategy to create authentic strategic direction. This identity-based strategy formation provided strategic coherence that enabled consistent stakeholder relationship development and strategic positioning. Where the identity-based approach suggests that optimal strategy formation under uncertainty may require integration

of personal and organisational identity development with strategic planning rather than purely analytical strategic development. The approach enables strategic authenticity that creates stakeholder relationships and competitive positioning through consistent value expression.

Phase Five Analysis - Crisis Control and Antifragile Development (January - March 2021)

Phase five represented the culmination of crisis management capability development represented in this research, with enterprises demonstrating integration of crisis conditions into operational excellence frameworks, supporting recent crisis adaptation research (Cowling et al., 2020; Kuckertz et al., 2020). The second lockdown served as a critical test of accumulated learning, revealing how enterprises had developed crisis management capabilities that exceeded simple adaptation to achieve strategic enhancement under adversity. Important to note, that this phase does not mark the end of the crisis (obviously, due to the introduction of the second national lockdown around this time), because this last phase only corresponds with the end of longitudinally diary intakes from six high-growth potential SMEs. The Covid-19 crisis continued being present for several months after the data collection process had finished.

During this phase and with the second reintroduction of the national lockdown, crisis normalisation represented the most significant achievement, with all enterprises integrating crisis conditions into normal operational frameworks rather than treating them as exceptional circumstances requiring special response (Uhl-Bien & Arena, 2018). This is where HGE-2's reflection that "*we did not need any help*" during the second lockdown demonstrates complete crisis competence that integrated crisis management into normal operational capabilities. This normalisation represents fundamental capability development that treated crisis conditions as manageable operational context rather than exceptional circumstances requiring special response.

Similarly, HGE-3's observation that "*I didn't notice a difference*" during renewed restrictions illustrates crisis integration that eliminated the distinction between crisis and normal operations, illustrates what Weick (1995) identifies as "requisite variety" achievement where organisational interpretive capacity matches environmental complexity. This normalisation supports Weick and Sutcliffe's (2007) argument that "mindful organising" creates "capabilities

for discriminating and acting" that enable sophisticated environmental navigation rather than simple environmental adaptation.

This integration suggests capability development that enhanced general operational resilience rather than simply crisis-specific response capabilities. The normalisation process appears to involve cognitive development that reconstructed crisis conditions as variation within normal operational parameters rather than exceptional disruption requiring extraordinary response. This reconstruction enabled strategic focus on development and enhancement rather than defensive adaptation and damage limitation.

The crisis normalisation achieved in phase five by enterprises reflects empirical patterns where SMEs that successfully integrated innovation practices with external support demonstrated significantly enhanced survival capabilities, with statistical analysis showing that external support strengthened the positive impact of innovation practices on business survival rather than just performance (Adam & Alarifi, 2021). Research on organisational resilience confirms that sustained crisis exposure creates self-reinforcing effects between organisational resilience and digitalisation levels, providing empirical support for the antifragile development concept (Ori et al., 2024).

Additionally, phase five demonstrated environmental construction capabilities that enabled proactive management of crisis conditions rather than reactive response to environmental constraints. This is where HGE-2's systematic preparation for second lockdown through financial reserves and operational planning illustrates anticipatory management that transformed crisis response from reactive to proactive strategic positioning. This proactive capability required environmental scanning and scenario planning that anticipated likely developments and prepared strategic responses in advance.

The organisational transformation achievements illustrate what Eisenhardt and Martin (2000) identify as "higher-order dynamic capabilities excellence" that enable "systematic capability development and strategic adaptation" for organisational enhancement that exceeds environmental requirements and competitive pressures (p. 1107). The enterprises demonstrated transformational capabilities that enable organisational development beyond environmental constraints through systematic capability enhancement and strategic innovation.

Antifragile development

The most significant phase five finding concerns continued strategic development during ongoing crisis conditions, demonstrating antifragile characteristics that enabled strategic enhancement rather than simple resilience maintenance. Where HGE-4's continued growth achievement and HGE-1's systematic business model exploration illustrate strategic development that leveraged crisis conditions for enhanced positioning. This continued development required capability integration that combined crisis management with strategic development to enable simultaneous survival and advancement. The capability suggests that optimal crisis management may achieve strategic enhancement through crisis condition leverage rather than simple crisis survival and recovery. The strategic positioning excellence demonstrates what Porter (1996) identifies as "strategic positioning" that creates "sustainable competitive advantage through unique value creation and delivery" (p. 68). However, the enterprises extended Porter's positioning concept through dynamic positioning that adapts and enhances competitive advantages through environmental change rather than maintaining static competitive positioning through environmental stability.

This provides clear evidence of antifragile development (Taleb, 2012) where enterprises emerged stronger from crisis conditions rather than simply recovering to pre-crisis performance levels. The analysis reveals mechanisms underlying antifragile development that enabled strategic enhancement through crisis exposure. For instance, the HGE-4's achievement of growth during continued crisis represents clear antifragile development that transformed crisis constraints into competitive advantages. The enterprise's strategic positioning through digital development enabled market capture that exceeded pre-crisis performance while competitors struggled with crisis adaptation.

This strategic enhancement required capability integration that combined crisis learning with strategic innovation to create competitive positioning that leveraged rather than simply adapted to crisis conditions. The enhancement mechanism suggests that antifragile development may require strategic thinking that treats crisis as opportunity for competitive advantage creation rather than simply challenge to be overcome. Similarly, HGE-3's reflection that crisis experience gave the company more demonstrates psychological development that expanded perceived organisational capability boundaries.

This confidence development enabled strategic ambition that exceeded pre-crisis scope through crisis-validated capability demonstration. The continuous improvement capabilities demonstrate what Zollo and Winter (2002) identify as "deliberate learning excellence" that enables "systematic knowledge articulation and codification" for enhanced capability development and competitive advantage creation (p. 340). The enterprises developed learning systems that continuously enhanced strategic and operational capabilities through systematic experience integration and knowledge development, supporting recent organisational learning research (Bapuji & Crossan, 2020; Argote & Miron-Spektor, 2011).

In other words, this antifragile development manifested through enhanced organisational capabilities, improved competitive positioning, and expanded strategic options that exceeded pre-crisis organisational potential. The nature of antifragile development across diverse organisational contexts provides strong empirical support for theories proposing that extreme conditions can enable organisational enhancement rather than simply damage and recovery.

Additionally, as exemplified again by HGE-3 and elements of HGE-2's development, demonstrated crisis mastery through systematic capability enhancement and organisational confidence development that expanded perceived organisational potential and competitive scope. HGE-3's reflection that crisis experience provided "*a great case study example to say, we went from sketch to ideas to see marked products within two months*" illustrates confidence development that validated organisational capabilities under extreme conditions while creating narrative resources for future strategic development and competitive positioning (Lengnick-Hall et al., 2011).

Antifragile Characteristic	Enterprise	Specific Evidence	Strategic Enhancement	Competitive Advantages
Continued Growth During Crisis	HGE-4	Growth achievement while competitors struggled	Digital development enabling market capture	Competitive positioning exceeding pre-crisis performance
Capability Expansion	HGE-3	"Crisis experience gave the company more" confidence	Psychological development expanding capability boundaries	Strategic ambition exceeding pre-crisis scope
Strategic Enhancement	HGE-1	Business model exploration leveraging crisis conditions	Enhanced positioning through crisis condition leverage	Strategic options exceeding pre-crisis potential
Operational Excellence	HGE-2	Proactive second lockdown preparation	Crisis management integrated into normal operations	Enhanced operational resilience

Table 6.13 - Antifragile Development Achievements, Author 2024

Important to note, that the concept of organisational antifragility through crisis exposure represents a fundamental departure from established resilience literature. While Sutcliffe & Vogus (2003) define organisational resilience as "the ability to absorb strain and preserve functioning," and Duchek (2020) focuses on "returning to normal operations," this research demonstrates that high-growth SMEs can achieve strategic enhancement that exceeds pre-crisis organisational potential. This directly challenges Burnard & Bhamra's (2019) conclusion that "recovery to previous performance levels represents optimal crisis outcomes for SMEs". Where the empirical evidence provides the systematic documentation of temporal antifragile development in SMEs, where sustained crisis exposure creates enhanced capabilities, strategic positioning, and competitive advantages that would be impossible under normal operational conditions. This extends beyond Taleb's (2012) theoretical framework by demonstrating practical mechanisms through which organisational antifragility develops through crisis learning accumulation.

Furthermore, the confidence development mechanism appears to involve retrospective sense-making (Weick, 1995) that reconstructed crisis experience as capability validation rather than simple survival achievement. This reconstruction created cognitive foundations for enhanced strategic development by demonstrating organisational capabilities under extreme conditions and enabling expanded strategic ambition and capability application. The evidence demonstrates strategic transformation that exceeded pre-crisis organisational potential through crisis-enabled capability development and strategic positioning enhancement. Rather than recovering to previous performance levels, the enterprises achieved strategic positions that provided enhanced competitive advantages and strategic options.

This transformation required strategic thinking that integrated crisis learning with strategic development to create enhanced positioning that leveraged crisis-developed capabilities for competitive advantage. The transformation process suggests that optimal crisis management may pursue strategic enhancement rather than recovery to enable antifragile development through crisis experience. The adaptive excellence illustrates what Sutcliffe and Vogus (2003) identify as "organisational resilience mastery" that enables "positive adaptation and strategic enhancement" through adversity leverage rather than simple adversity management (p. 94). The enterprises developed resilience capabilities that enabled strategic transformation through challenge exposure and adversity utilisation for competitive advantage creation and organisational excellence (Duchek, 2020; Burnard & Bhamra, 2019).

Authentic purpose integration and sense-making intelligence

Additionally, phase five demonstrated evolution from individual crisis management to ecosystem leadership, with enterprises contributing to broader ecosystem resilience while enhancing their own strategic positioning through collaborative development and knowledge sharing. For instance, HGE-2's validation of diversification strategy through crisis success created ecosystem learning that demonstrated the effectiveness of strategic diversification for crisis resilience. This contribution provided ecosystem intelligence that enhanced collective understanding of effective crisis management approaches while positioning HGE-2 as thought leader in strategic development. The ecosystem contribution required understanding of how individual enterprise experience connected with broader ecosystem learning needs. The enterprises that developed superior ecosystem contribution understood

how knowledge sharing could create strategic positioning through thought leadership while contributing to collective capability development (Pozzebon, 2004; Greenwood et al., 2017).

Similarly, HGE-6's systematic development of enhanced communication and organisational culture practices demonstrates internal ecosystem development that created organisational resilience through collaborative capability enhancement. The focus on leadership team communication and employee wellbeing created organisational capabilities that enhanced performance while contributing to broader understanding of effective crisis management approaches.

This collaborative development required understanding of how individual capability development connected with collective organisational effectiveness. The approach suggests that ecosystem leadership may require internal collaboration development that creates organisational resilience through enhanced communication and relationship capabilities. Several enterprises such as HGE-2, HGE-5 and HGE-6 developed strategic influence within their respective ecosystems through demonstrated crisis management success and innovative approaches to challenge management. This influence created strategic positioning that provided access to opportunities and resources through reputation and relationship development.

The influence development appears to derive from consistent value expression and strategic success that created stakeholder confidence in enterprise capabilities and judgment. The influence positioning suggests that crisis management success can create strategic resources through reputation and relationship development that support continued strategic development and ecosystem contribution. The strategic agility achievements illustrate what Doz and Kosonen (2008) identify as "strategic agility" that enables "strategic sensitivity, leadership unity, and resource fluidity" for competitive advantage creation under changing conditions. The enterprises achieved strategic agility that enabled continued competitive advantage development regardless of environmental volatility or competitive pressure.

Mastery Indicator	Enterprise Evidence	Capability Development	Strategic Implications
Crisis Normalisation	HGE-2 "did not need help", HGE-3 "didn't notice difference"	Crisis conditions integrated into normal operational frameworks	Enhanced general operational resilience
Proactive Management	HGE-2 systematic second lockdown preparation	Environmental construction capabilities	Crisis response transformation from reactive to proactive
Strategic Enhancement	HGE-4 continued growth, HGE-1 business model exploration	Antifragile development through crisis condition leverage	Strategic positioning exceeding pre-crisis potential
Ecosystem Leadership	Multiple enterprises demonstrating strategic influence	Thought leadership through demonstrated crisis success	Strategic resources through reputation and relationship development

Table 6.14 - Crisis Mastery and Competence Development, Author 2024

The evidence reveals how authentic purpose integration enabled strategic excellence that combined business success with personal meaning and stakeholder value creation. This integration provided strategic coherence that enabled consistent stakeholder relationship development and competitive positioning through authentic value expression. Where the authenticity integration suggests that optimal strategic development may require integration of personal meaning with business strategy to create authentic strategic direction that enables stakeholder relationship development and competitive positioning through consistent value expression and purpose alignment. The strategic influence demonstrated what Stones (2005) characterises as "strategic agency mastery" where enterprises developed sophisticated capabilities for structural influence and environmental shaping through strategic innovation and relationship development that reshaped competitive and institutional systems. The enterprises achieved what he terms "transformative agency excellence" that enables systematic structural modification through strategic action and collaborative relationship development.

Phase five exhibited strategic proficiency that integrated continuous development capabilities with operational excellence to enable sustained strategic enhancement and competitive advantage development under uncertainty. The continuation and enhancement of strategic planning capabilities during continued crisis demonstrates strategic mastery that integrated crisis learning with systematic strategic development. The enterprises developed planning capabilities that balanced systematic analysis with experimental learning to enable comprehensive strategic development under uncertainty. This planning excellence required cognitive frameworks that combined analytical evaluation with experimental learning to enable strategic development that balanced systematic planning with adaptive response to changing conditions. The excellence suggests that strategic mastery may require integration of planning and experimental approaches rather than reliance on single strategic development methodologies. This integration enabled continuous development that enhanced competitive advantages while building capabilities for continued strategic development (Duchek, 2020; Burnard & Bhamra, 2019).

Lastly, this phase demonstrated significant achievement of crisis grasp across enterprises, with the second lockdown serving as a critical validation of accumulated crisis management learning and capability development. The competence development demonstrated during this phase indicates that sustained crisis exposure creates genuine crisis management capabilities that exceed crisis-specific adaptation to encompass general resilience and adaptive capacity enhancement. This achievement challenges traditional crisis management frameworks that emphasise recovery and return to normalcy, instead demonstrating how extended crisis management can create organisational capabilities that exceed pre-crisis potential.

Enterprise	Normalisation Evidence	Operational Integration	Crisis Competence	Strategic Implications
HGE-1	Systematic business model exploration during crisis	Crisis learning integrated with strategic development	Enhanced strategic positioning	Continued development under adversity
HGE-2	"We did not need any help" during second lockdown	Complete crisis competence integration	Proactive crisis management	Financial reserves + operational planning
HGE-3	"I didn't notice a difference" during renewed restrictions	Crisis integration eliminating distinction from normal operations	Operational resilience enhancement	Strategic focus on development vs defence
HGE-4	Continued growth achievement during ongoing crisis	Crisis conditions leveraged for enhanced positioning	Antifragile development demonstration	Market capture exceeding pre-crisis performance
HGE-5	Ecosystem leadership development	Strategic influence through demonstrated success	Reputation-based strategic positioning	Access to opportunities through relationship development
HGE-6	Enhanced communication and organisational culture	Internal ecosystem development	Organisational resilience through collaboration	Leadership team communication + employee wellbeing

Table 6.15 - Crisis Normalisation and Operational Integration, Author 2024

From Crisis Survival to Strategic Transformation shift

The most distinctive contribution of this thesis lies in its demonstration that high-growth Scottish SMEs do not merely survive crisis conditions but emerge transformed with enhanced capabilities, strategic positioning, and competitive advantages that exceed their pre-crisis potential. This finding challenges the fundamental assumptions underlying crisis management literature, which predominantly focuses on resilience (Sutcliffe & Vogus, 2003;

Lengnick-Hall et al., 2011), recovery (Starr et al., 2003), and return to normalcy (Duchek, 2020; Williams et al., 2017; Burnard & Bhamra, 2019). Instead, the empirical evidence reveals what Taleb (2012) characterises as antifragile development, extended by recent crisis entrepreneurship research (Kuckertz et al., 2020; Kraus et al., 2020), where organisations gain strength from adversity exposure rather than simply maintaining stability or recovering to previous performance levels.

This shift has implications on how organisational development under extreme conditions is understood. Traditional crisis management frameworks assume that the optimal outcome involves returning to pre-crisis operational states with minimal damage and disruption (Quarantelli, 1988; Rosenthal et al., 1989; Linnenluecke, 2017; Herbane, 2019). However, the temporal analysis across five crisis phases demonstrates that enterprises can leverage crisis conditions to accelerate capability development, strategic innovation, and competitive positioning in ways that would be difficult or impossible under normal operational conditions (Brown & Eisenhardt, 1997; Eisenhardt & Martin, 2000; Teece, 2018; Eisenhardt et al., 2016; Prashantham et al., 2019).

The crisis served as a catalyst for organisational alteration that compressed normal development timelines while creating enhanced integration outcomes through necessity-driven innovation and adaptive learning processes (Cohen & Levinthal, 1990; Zollo & Winter, 2002; Zahra & George, 2020; Leih & Teece, 2016; Rahmandad et al., 2018). The Covid-19 context provides unique insights into digital transformation acceleration and virtual collaboration capabilities that previous crisis studies could not capture (Kraus et al., 2020; Papadopoulos et al., 2020). The pandemic's global scale and simultaneous impact across all sectors created what Kuckertz et al., (2020) term "universal crisis conditions" that enabled comparative analysis across diverse organisational contexts while revealing common patterns of antifragile development.

The antifragile development concept extends beyond simple organisational resilience to encompass fundamental enhancement of organisational capabilities, strategic positioning, and competitive effectiveness. Building on Taleb's (2012) theoretical framework, and recent antifragility research in organisational contexts (Derbyshire, 2016; Ramezani & Camarinha-Matos, 2020), the enterprises demonstrated systematic progression from initial cognitive

disruption through strategic adaptation, capability integration, enhanced development, and ultimately crisis mastery that normalised uncertainty as standard operational context.

Temporal Learning Accumulation: The Dynamic Development Process

This research's unique contribution centres on the identification and systematic analysis of temporal learning accumulation processes that enable progressive capability enhancement across crisis phases. Unlike previous research that examines crisis response as discrete events or before-after comparisons (Herbane, 2010; Doern, 2016; Williams et al., 2017; Cowling et al., 2020; Kuckertz et al., 2020), this investigation reveals how crisis management capabilities develop through sustained exposure and learning integration across multiple temporal phases, creating developmental trajectories that transform organisational potential permanently.

The temporal dimension proves crucial for understanding how individual crisis experiences accumulate into enhanced organisational capabilities through crisis learning integration mechanisms. Drawing on organisational learning theory (Argote & Miron-Spektor, 2011; Crossan et al., 2011; Bapuji & Crossan, 2020), each phase built upon previous learning while creating new challenges that required enhanced capabilities and strategic sophistication. Recent research on organisational learning during crises (Battisti & Deakins, 2017; Cowling et al., 2020) supports the finding that sustained crisis exposure creates accelerated learning cycles and enhanced adaptive capacity beyond normal organisational development trajectories.

The learning accumulation process reveals fundamental mechanisms through which crisis experience transforms into enhanced organisational capabilities. First cognitive integration demonstrates how crisis experience enhances interpretive frameworks and environmental understanding, enabling more sophisticated sense-making and strategic evaluation under uncertainty, aligning with recent advances in managerial cognition research (Helfat & Peteraf, 2015; Eggers & Kaplan, 2013). Second, capability synthesis shows how crisis-developed competencies combine with existing organisational capabilities to create enhanced performance and competitive positioning that exceeds simple additive effects, supporting dynamic capabilities theory evolution (Teece, 2018; Peteraf et al., 2013).

Third, strategic enhancement illustrates how crisis learning enables competitive advantage creation and strategic positioning improvements that provide lasting benefits beyond crisis-specific applications, consistent with recent resource orchestration research (Sirmon et al., 2011; Chadwick et al., 2015). This temporal perspective aligns with recent developments in dynamic capabilities theory (Teece, 2018) and organisational ambidexterity research (Raisch & Birkinshaw, 2008; O'Reilly & Tushman, 2013) by demonstrating how sustained challenge exposure can accelerate learning and capability development beyond normal organisational development timelines. While Weick (1995) treats sense-making as cognitive processing for environmental interpretation, this research demonstrates that sense-making functions as a dynamic capability that develops sophistication through crisis exposure. This extends beyond Maitlis & Christianson's (2014) individual-level analysis to show how organisational sense-making capabilities compound across temporal phases, creating interpretive frameworks that enable strategic transformation rather than simply environmental adaptation.

Value Integration as Strategic Resource Creation

One of the research's most significant findings concerns the demonstration that ethical considerations and value-based decision-making can enhance rather than constrain strategic effectiveness under extreme conditions. These finding challenges fundamental assumptions in strategic management literature about trade-offs between ethical behaviour and competitive performance (Kaptein, 2019; Schaltegger et al., 2016; Laasch, 2018), instead revealing how consistent value expression during challenging conditions creates strategic resources through stakeholder relationship development, competitive differentiation, and strategic authenticity that provide sustainable competitive advantages.

The value integration process demonstrates how ethical frameworks can function as strategic capabilities rather than external constraints on strategic action. Building on stakeholder theory and instrumental stakeholder approaches (Freeman et al., 2018; Parmar et al., 2010; Jones et al., 2018), the enterprises that maintained consistent ethical approaches during crisis conditions achieved strategic positioning through stakeholder confidence and relationship development. This aligns with recent research on stakeholder capitalism (Bebchuk & Tallarita, 2020) and purpose-driven organisational (Hollensbe et al., 2014; George et al., 2016) that demonstrates how authentic value expression creates sustainable competitive advantages.

The empirical evidence reveals how values function as cognitive anchors during extreme uncertainty, providing decision-making frameworks that enable strategic coherence when traditional planning approaches become inadequate. This finding contributes to growing literature on purpose-driven strategy (George et al., 2016; Gartenberg et al., 2019) and sustainable business models (Schaltegger et al., 2016; Geissdoerfer et al., 2018) by demonstrating practical mechanisms through which value-based approaches create competitive advantages during crisis conditions. The strategic value of ethical frameworks has been empirically validated through COVID-19 research demonstrating that SMEs maintaining consistent value-based approaches achieved superior stakeholder relationship development and competitive positioning, with innovation practices showing stronger survival impacts when combined with authentic value expression (Adam & Alarifi, 2021).

Ecosystem-Level Resilience and Collaborative Development

The research reveals an important dimension of crisis management that extends beyond individual enterprise adaptation to encompass collaborative ecosystem development and collective resilience building. The analysis demonstrates how individual enterprise crisis management success contributes to broader ecosystem resilience while creating strategic positioning advantages through knowledge sharing, collaborative problem-solving, and mutual learning that benefits both individual enterprises and broader support systems (Powell, 1990; Kapoor & Lee, 2013; Adner, 2017; Jacobides et al., 2018).

The collaborative dimension challenges competitive assumptions in strategic management literature (Porter, 1980, 1985) by demonstrating how collective capability development can enhance individual competitive positioning through ecosystem contribution and shared learning. Drawing on network theory (Burt, 2005 & 2019; Granovetter, 2017) and social capital literature (Nahapiet & Ghoshal, 2021; Adler & Kwon, 2002), the enterprises that developed superior institutional relationships achieved enhanced resource access and strategic development support through collaborative engagement that created mutual value beyond simple resource transfer. This collaborative approach enabled strategic advantages through collective capability development while contributing to broader ecosystem effectiveness and resilience, aligning with recent ecosystem theory developments (Adner,

2017; Jacobides et al., 2018) and collaborative advantage research (Dyer & Singh, 1998; Lavie et al., 2010).

The ecosystem-level analysis reveals how crisis conditions can stimulate institutional learning and capability development when appropriate feedback mechanisms enable collaborative improvement between enterprises and support systems. Building on institutional theory (Thornton et al., 2012**;** Scott, 2014; Greenwood et al., 2017), the progression of institutional support quality across crisis phases demonstrates systematic learning that improved resource allocation effectiveness while reducing administrative burden for enterprises. The ecosystem-level resilience patterns observed align with empirical research on Swedish SMEs showing that crisis management effectiveness emerged through collaborative sense-making and shared learning systems rather than individual enterprise capabilities alone (Fabeil et al., 2021). Recent Australian research confirms that supply chain resilience during COVID-19 required collaborative capability development, with businesses achieving enhanced resilience through efficiency, flexibility, and collaborative sourcing relationships rather than autonomous approaches (Bennett et al., 2022).

Important to note, that crisis management literature predominantly focuses on individual organisational survival (Herbane, 2019; Williams et al., 2017), with limited attention to ecosystem-level contributions. This research provides the empirical evidence of how individual SME crisis management success contributes to broader ecosystem resilience through knowledge sharing, collaborative problem-solving, and institutional relationship development. This challenges the competitive assumptions underlying crisis management theory and demonstrates how crisis conditions can stimulate collaborative ecosystem development that benefits both individual organisations and broader support systems.

Theoretical Innovation: Dynamic Integration Under Extreme Conditions

Lastly, the research makes a methodological and theoretical contribution by demonstrating how multiple theoretical frameworks can be integrated dynamically to create enhanced understanding of complex organisational phenomena. Rather than treating theories as separate analytical lenses that provide independent insights (Eisenhardt et al., 2016; Yin, 2018; Gehman et al., 2018), the analysis reveals how sense-making theory (Weick, 1995),

effectuation theory (Sarasvathy, 2001, 2008), resource-based theory (Barney, 1991; Barney et al., 2021; Kraaijenbrink et al., 2010), emergent strategy theory (Mintzberg, 1994; Mirabeau & Maguire, 2014; Jarzabkowski & Kaplan, 2015), bricolage theory (Baker & Nelson, 2005), frugality theory (Bhattacharya & Patel, 2010; Tiwari & Herstatt, 2012; Cunha et al., 2014; Radjou & Prabhu, 2015), resilience theory (Sutcliffe & Vogus, 2003; Duchek, 2020; Burnard & Bhamra, 2019), and strong structuration theory (Stones, 2005; Giddens, 1984) interact temporally to create synergistic explanatory power that exceeds individual theoretical contributions.

The theoretical integration demonstrates emergence of such theories under extreme conditions, where sustained application of theoretical frameworks under challenging circumstances enhances their sophistication and integration possibilities. Crisis management literature predominantly applies single theoretical frameworks (effectuation OR resource-based OR resilience), with Kuckertz et al. (2020) noting that "theoretical integration remains limited in crisis entrepreneurship research." This research demonstrates that crisis management effectiveness emerges through dynamic integration of multiple theoretical frameworks that evolve and interact temporally.

The dynamic theoretical integration approach employed in this research aligns with emerging methodological frameworks in COVID-19 SME research, where systematic literature reviews have revealed that successful crisis management requires integration of multiple theoretical perspectives rather than single-lens approaches (Hossain & Akhter, 2022). Recent empirical work validates this multi-theoretical approach, demonstrating that SME innovation practices encompassing external knowledge, structural adaptation, leadership development, regeneration capabilities, and employee engagement create synergistic effects that exceed individual theoretical predictions (Adam & Alarifi, 2021).

The Crisis Management Capability Development Model

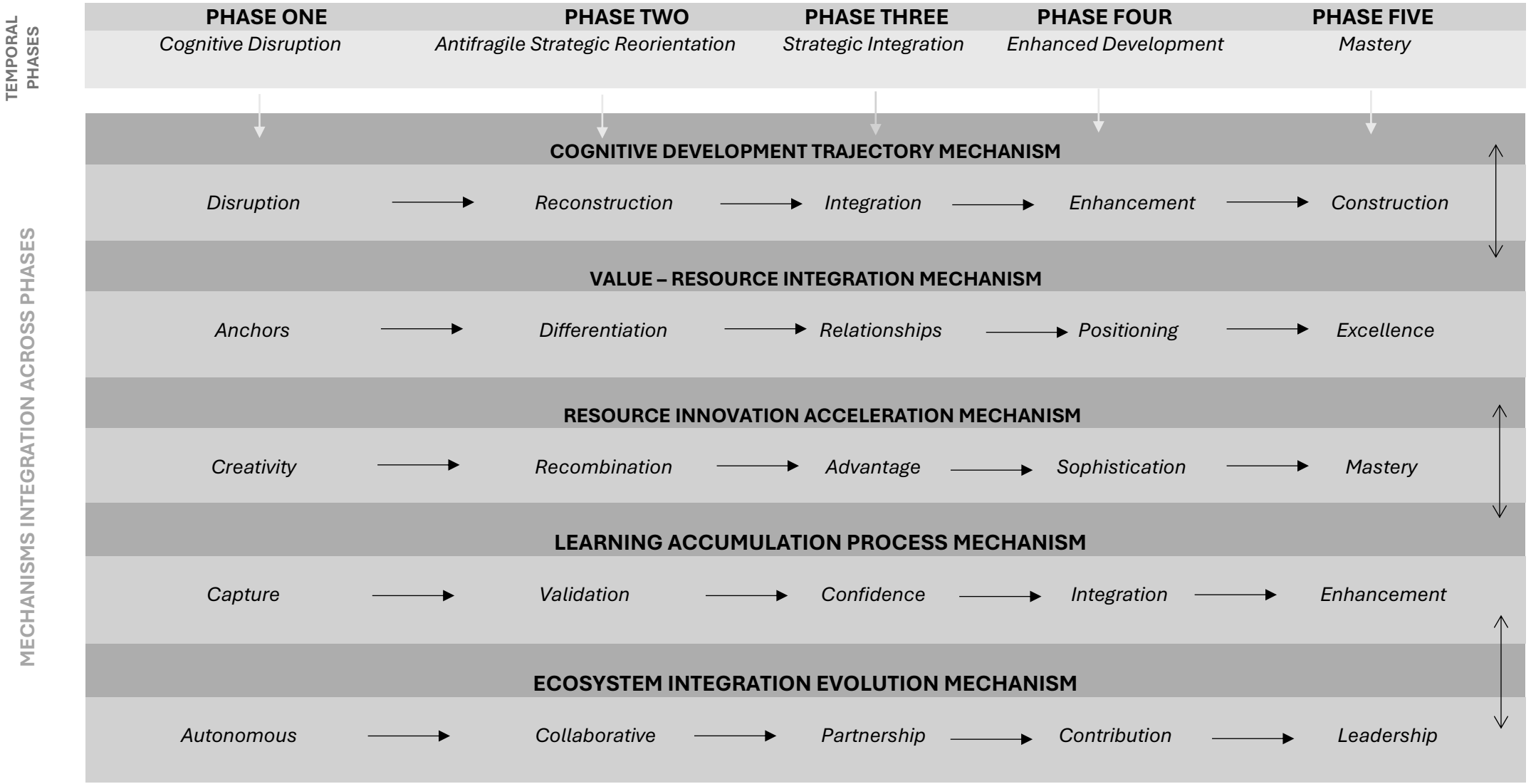
Based on the comprehensive analysis and discussion chapter, the research contributes to the understanding of crisis management where traditional frameworks emphasise survival and recovery to reveal how extreme conditions can accelerate organisational development and create lasting competitive advantages. This analysis synthesises the empirical findings from

six high-growth potential Scottish SMEs during the COVID-19 pandemic to develop a comprehensive conceptual framework for understanding crisis management capabilities. Through systematic analysis of the longitudinal data across five crisis phases, this analysis identifies five core themes that emerged from the intersection of sense-making processes, strategic adaptation mechanisms, and resource innovation practices.

Additionally, another primary outcome demonstrates that crisis management effectiveness emerges through dynamic, temporal integration of multiple theoretical frameworks rather than static application of individual theories, challenging conventional approaches that rely on single theoretical lenses (Pearson & Clair, 1998; Bundy et al., 2017; Herbane, 2019; Doern et al., 2019; Kuckertz et al., 2020) and revealing how theories evolve, mature, and interact over time to create organisational capabilities exceeding individual theoretical predictions.

Based on the above discussed, this thesis proposes '*The Crisis Management Capability Development Model*' that represents a dynamic, multi-dimensional framework that synthesises the empirical findings into a coherent theoretical understanding of *how high-growth SMEs develop enhanced organisational capabilities through sustained crisis exposure*. This model reconceptualises crisis management from a defensive, damage-limitation approach to a developmental process that enables organisational enhancement and antifragile characteristics.

The framework (below 6.0) is constructed around five core mechanisms that operate simultaneously across temporal phases, creating a complex adaptive system that enables progressive capability development. These mechanisms do not operate in isolation but form an integrated capability development ecosystem where each mechanism reinforces and amplifies the others.



Framework 6.0 - The Crisis Management Capability Development Conceptual Model, Author, 2025

Mechanism one: Cognitive Development Trajectory

The Cognitive Development Trajectory represents the fundamental sense-making evolution that enables enterprises to progress from cognitive disruption to environmental construction capabilities. This mechanism operates through Weick's (1995) sense-making properties but extends them through empirical demonstration of how sustained crisis exposure creates interpretive sophistication that exceeds normal organisational potential.

The trajectory begins with universal *cognitive disruption* where established interpretive frameworks prove inadequate for crisis comprehension and response. This breakdown, experienced across all enterprises regardless of their pre-crisis characteristics, creates what Weick (1995) identifies as identity crisis where "who we are as an organisational " becomes unclear when environmental conditions exceed interpretive capacity. The universality of this disruption validates the temporal approach by demonstrating that extreme environmental discontinuity transcends organisational boundaries and capabilities.

Framework reconstruction emerges through crisis-specific interpretive development that integrates crisis experience with existing knowledge to create enhanced understanding of environmental possibilities. HGE-4's evolution from being "very much up in the air" to systematic digital transformation planning demonstrates sense-making framework reconstruction that moved beyond reactive adaptation to proactive strategic reconstruction. This development illustrates Weick's argument that "sense-making is about the ways people generate what they interpret" rather than simply discovering predetermined environmental conditions.

Strategic integration represents the synthesis of crisis learning with operational recovery, demonstrating capability development that balances reopening opportunities with continued crisis preparation. This integration illustrates what Weick and Sutcliffe (2007) characterise as "mindful organising" that enhances capabilities for discriminating between relevant and irrelevant environmental signals while maintaining operational effectiveness under uncertain conditions.

Identity enhancement occurs through retrospective sense-making that reconstructs crisis experience as capability validation rather than simple survival achievement. This reconstruction creates cognitive foundations for enhanced strategic development by demonstrating organisational capabilities under extreme conditions. HGE-3's reflection that crisis experience "gave our company a bit more confidence now to be able to think that we can just go out and do this" illustrates psychological capability development that expanded perceived organisational potential through crisis success validation.

Environmental construction represents the culmination of cognitive development where enterprises develop proactive management capabilities that shape rather than simply adapt to crisis conditions. HGE-2's systematic preparation for the second lockdown through financial reserves and operational planning illustrates anticipatory management that transformed crisis response from reactive to proactive strategic positioning. This capability demonstrates what Weick (1995) characterises as "enactment sophistication" where enterprises actively construct favourable environmental conditions rather than simply adapting to predetermined constraints.

Mechanism two: Value-Resource Integration

Value-Resource Integration represents the synthesis of ethical frameworks with strategic resource management to create competitive advantages through stakeholder relationship development and authentic strategic positioning. This mechanism challenges traditional assumptions about trade-offs between ethical behaviour and strategic effectiveness by demonstrating how value-based decision-making can enhance competitive positioning through stakeholder engagement and reputation development.

The integration begins with values emergence as *cognitive anchors* during interpretive breakdown when normal strategic frameworks become obsolete. Values provide interpretive stability that enables coherent decision-making during framework reconstruction, supporting Weick's (1995) identity construction property by demonstrating how value expression maintains organisational identity during operational disruption. HGE-2's explicit decision not to "be seen to be profiting from these circumstances" when producing hand sanitiser

demonstrates value-based strategic thinking that prioritised long-term reputational positioning over immediate revenue generation.

Strategic differentiation develops through consistent value expression that creates stakeholder relationships and competitive positioning that exceeds purely transactional approaches. HGE-3's cost-recovery approach to PPE production created strategic positioning that enhanced community relationships while building manufacturing confidence. The ethical approach enabled sustained community engagement that provided market intelligence and relationship development beyond simple revenue generation.

Stakeholder relationship development occurs through authentic value expression that creates social capital providing strategic advantages through stakeholder commitment and engagement. The enterprises that maintained ethical consistency during extended crisis conditions achieved strategic positioning as reliable and trustworthy organisations that stakeholders could depend on during challenging conditions.

Competitive positioning emerges through integrated value-resource strategies that create strategic advantages through authentic purpose alignment with stakeholder value creation. HGE-1's movement toward "doing and trying to get the business thing that I enjoy more" demonstrates value integration that created strategic resources through authentic purpose alignment, enabling stakeholder relationships and employee engagement that provided competitive advantages through enhanced organisational performance and market positioning.

Mechanism three: Resource Innovation Acceleration

Resource Innovation Acceleration represents the process through which extreme resource constraints stimulate creative resource utilisation that creates competitive advantages exceeding normal resource abundance outcomes. This mechanism directly challenges traditional resource-based theory assumptions that constraints limit strategic options by demonstrating how extreme limitations can accelerate innovative resource combination that creates lasting competitive advantages.

Constraint-driven creativity emerges when resource limitations force rapid experimentation that compresses normal innovation cycles from months to weeks. HGE-3's immediate recognition that laser cutting equipment could produce medical shields demonstrates what Barney (1991) identifies as "resource heterogeneity" where similar resources create different competitive advantages based on application and combination approaches. The crisis created what he characterises as "resource value" transformation where previously neutral resources became strategically valuable through changed environmental conditions.

Strategic recombination develops through what Penrose (1959) identifies as "productive services" creation where "the same resources provide different services" based on application and combination approaches. HGE-3's scaling production to over 20,000 face shields using existing technological infrastructure demonstrates resource recombination that achieved rapid business model transformation while building lasting manufacturing capabilities. This recombination required both technical capability assessment and market opportunity recognition that identified viable applications for existing resources under changed environmental conditions.

Competitive advantage creation occurs through resource innovation that meets Barney's (1991) VRIN criteria through unique combination of existing resources with novel applications under extreme conditions that competitors cannot easily replicate. The crisis-developed capabilities possessed VRIN characteristics through strategic development rather than simple resource accumulation, creating what he characterises as "sustained competitive advantage" through resources that are "valuable, rare, imperfectly imitable, and not substitutable."

Portfolio sophistication emerges through advanced resource orchestration that enables comprehensive management of resource portfolios through sophisticated structuring, bundling, and leveraging capabilities. HGE-4's systematic funding acquisition while maintaining network-based resource access demonstrates portfolio thinking that balanced institutional and autonomous resource streams, requiring cognitive sophistication to evaluate different resource types and access mechanisms while maintaining strategic coherence across multiple resource relationships.

Mechanism four: Learning Accumulation Process

Learning Accumulation Process represents the systematic capture and integration of crisis experience to create organisational learning capabilities that enhance strategic development and competitive positioning. This mechanism operates through what Zollo and Winter (2002) identify as "deliberate learning" that enables "systematic knowledge articulation and codification" for enhanced capability development and competitive advantage creation.

Crisis experience capture occurs through systematic reflection and analysis that treats crisis events as learning opportunities rather than simply challenges to overcome. The enterprises that developed superior learning capabilities understood how experience documentation and analysis could create strategic advantages through enhanced decision-making and strategic development capabilities.

Capability validation develops through retrospective sense-making that reconstructs crisis experience as capability demonstration rather than simple survival achievement. This validation process creates psychological resources that enable enhanced strategic development by demonstrating organisational capabilities under extreme conditions and enabling expanded strategic ambition. The confidence development mechanism appears to involve cognitive reconstruction that validates expanded capability claims through crisis performance demonstration.

Confidence development emerges through accumulated success in crisis management that expands perceived organisational potential and strategic scope. HGE-3's reflection that crisis experience gave the company more confidence demonstrates psychological development that expanded capability boundaries through crisis-validated capability demonstration. This confidence enabled strategic ambition that exceeded pre-crisis scope through sustained capability validation.

Strategic enhancement occurs through integration of crisis learning with strategic development to create enhanced positioning that leverages crisis-developed capabilities for competitive advantage. Rather than recovering to previous performance levels, successful

enterprises achieved strategic positions that provided enhanced competitive advantages and strategic options that would be difficult to achieve under normal operational conditions.

Mechanism five: Ecosystem Integration Evolution

Ecosystem Integration Evolution represents the progression from individual crisis management to collaborative ecosystem development that creates mutual value through knowledge sharing, collaborative problem-solving, and strategic partnership development. This mechanism demonstrates how individual enterprise enhancement connects with broader ecosystem resilience and effectiveness.

Autonomous response characterises initial crisis management approaches that prioritise self-reliance over institutional dependence, reflecting either negative previous institutional experiences or strategic preference for maintaining decision-making autonomy during uncertainty. HGE-1's recognition that "there is really no one to help me" and HGE-5's preference to "rely on ourselves" demonstrate autonomous approaches that enabled rapid decision-making without institutional coordination delays.

Collaborative development emerges through recognition that institutional relationships can create strategic value through collaborative problem-solving and mutual learning. HGE-2's experience that institutions "really try to understand what we are asking, and then come up with alternative ideas" demonstrates institutional relationship evolution from transactional resource provision to collaborative strategic development that created value through creative problem-solving exceeding simple resource transfer.

Strategic partnership develops through institutional engagement that treats relationships as strategic assets requiring ongoing development and maintenance. HGE-3's confidence in identifying "who the right person to talk to" demonstrates institutional navigation capabilities that understood optimal access pathways and relationship management for effective engagement. The navigation capability development required both cognitive mapping of institutional ecosystems and social capability development for effective relationship management.

Ecosystem *leadership* emerges through demonstrated crisis management success that creates strategic influence within respective ecosystems. This influence created strategic positioning that provided access to opportunities and resources through reputation and relationship development. The influence development appears to derive from consistent value expression and strategic success that created stakeholder confidence in enterprise capabilities and judgment.

The five mechanisms *interact vertically* through mutual reinforcement where development in one mechanism enables and accelerates development in others. Cognitive development provides interpretive foundations for value integration, which guides resource innovation, which creates learning opportunities, which enables ecosystem contribution, which provides environmental feedback that enhances cognitive development. Each temporal phase represents a distinct developmental stage where all five mechanisms operate simultaneously but with different emphasis and sophistication. The *horizontal progression* demonstrates how sustained crisis exposure enables mechanism maturation that creates enhanced organisational potential through accumulated learning and capability development. The framework demonstrates capability compounding where developments in earlier phases create foundations for enhanced capabilities in later phases.

The five mechanisms operate simultaneously but with varying prominence across the temporal phases, creating a complex developmental trajectory that enables progressive capability enhancement. The temporal dimension proves crucial for understanding how these mechanisms interact to create antifragile development that exceeds pre-crisis organisational potential.

Important to distinguish that, the five mechanisms are not based on the five crisis phases, representing instead an important conceptual distinction that requires clarification to understand the framework's sophisticated architecture. The five crisis phases represent discrete temporal periods spanning from March 2020 through March 2021, beginning with phase one cognitive disruption in march 2020, progressing through phase two strategic reorientation from April to June 2020, continuing with phase three strategic integration from June to September 2020, advancing to phase four enhanced development from September 2020 to January 2021, and culminating in phase five antifragile mastery from January to

March 2021. These phases represent chronological periods during which specific developmental characteristics and organisational responses predominated across the six high-growth enterprises.

In contrast, the five mechanisms represent capability development processes that operate continuously throughout the entire crisis period rather than being confined to specific temporal phases. These mechanisms encompass the Cognitive Development Trajectory, Value-Resource Integration, Resource Innovation Acceleration, Learning Accumulation Process, and Ecosystem Integration Evolution, each representing distinct but interconnected organisational capabilities that develop and mature across the entire temporal framework. The mechanisms function as persistent developmental processes that enable progressive capability enhancement rather than phase-specific responses to particular crisis conditions.

The relationship between mechanisms and phases demonstrates sophisticated organisational development where all five mechanisms operate simultaneously across all five phases, but with different emphasis in each phase, varying levels of sophistication as they develop, and different prominence depending on the specific characteristics and developmental requirements of each temporal period. The *Cognitive Development Trajectory* operates throughout all phases but progresses from initial disruption in phase one to sophisticated environmental construction capabilities in phase five, while *Value-Resource Integration* starts with values functioning as cognitive anchors during phase one uncertainty and evolves to authentic purpose integration that creates strategic excellence in phase five. Similarly, *Resource Innovation* begins with constraint-driven creativity in phase one and develops through strategic recombination and competitive advantage creation to achieve portfolio sophistication and resource orchestration mastery in phase five.

The framework structure demonstrates how these five mechanisms interact and evolve across the five temporal phases to create progressive capability development through a matrix relationship where horizontal progression represents temporal stages with different developmental focus, vertical progression represents capability development processes that span all phases. The integration demonstrates how each mechanism manifests differently in each phase while contributing to overall organisational enhancement. This matrix structure enables understanding of how sustained crisis exposure creates capability compounding

where each mechanism reinforces and amplifies the others across temporal development, creating the foundation for organisational development that exceeds pre-crisis potential through systematic capability enhancement rather than simple crisis adaptation or recovery.

Conclusion

This analysis and discussion chapter has systematically examined the evolution of crisis management capabilities and decision-making processes across six high-growth potential Scottish SMEs during the COVID-19 pandemic, revealing fundamental insights that challenge conventional crisis management paradigms while advancing theoretical understanding of organisational development under extreme conditions. Through comprehensive temporal analysis across five distinct crisis phases, the chapter has demonstrated how these enterprises developed increasingly sophisticated capabilities that transformed crisis exposure from existential threat into strategic opportunity for organisational enhancement and competitive advantage creation.

The chapter has revealed that crisis management in high-growth SMEs represents a fundamentally dynamic process characterised by temporal learning accumulation, strategic resource innovation, and collaborative sense-making evolution rather than static survival responses or predetermined recovery patterns. The five-phase analytical framework has demonstrated how each temporal period built upon previous learning while creating new challenges that required enhanced capabilities, revealing crisis management as an accelerated organisational development process that compresses normal capability development timelines while creating superior outcomes through necessity-driven innovation and adaptive learning. The analysis has established three fundamental mechanisms through which crisis experience transforms into enhanced organisational capabilities: cognitive integration showing how crisis exposure enhances interpretive frameworks and environmental understanding; capability synthesis demonstrating how crisis-developed competencies combine with existing organisational capabilities to create enhanced performance; and strategic enhancement illustrating how crisis learning enables competitive advantage creation and strategic positioning improvements that provide lasting benefits beyond crisis-specific applications.

The comprehensive thematic analysis has revealed five core themes that fundamentally reconceptualise crisis management as a dynamic capability development process rather than defensive survival activity. The Temporal Crisis Learning Accumulation theme demonstrates how sustained crisis exposure creates progressive learning spirals that compound organisational effectiveness over time, challenging traditional views of crisis as discrete events requiring uniform responses. The Values as Strategic Resources theme reveals how ethical frameworks function as competitive advantages rather than constraints, providing cognitive stability and stakeholder differentiation that enhance strategic effectiveness during extreme uncertainty. The Strategic Resource Innovation Under Constraint theme establishes how extreme resource limitations stimulate creative resource utilisation that creates competitive advantages exceeding normal resource abundance outcomes, directly contradicting traditional resource-based theory assumptions about constraints limiting strategic options. The Sense-Making Evolution and Environmental Construction theme demonstrates how enterprises progress from cognitive disruption to proactive environmental management through sophisticated interpretive development. Finally, the Antifragile Organisational Development theme provides empirical validation of how crisis exposure enables organisational enhancement that exceeds pre-crisis potential through systematic capability development and strategic positioning improvements.

The chapter's central theoretical contribution lies in the development of the Crisis Management Capability Development Model, an integrated conceptual framework that synthesises these five themes into a sophisticated understanding of how high-growth SMEs transform crisis conditions into strategic opportunities. The model reveals five core mechanisms operating simultaneously across temporal phases: the Cognitive Development Trajectory representing sense-making evolution from disruption to environmental construction; Value-Resource Integration demonstrating how ethical frameworks create competitive advantages through stakeholder relationship development; Resource Innovation Acceleration showing how constraints stimulate creative resource utilisation for competitive advantage creation; Learning Accumulation Process illustrating how crisis experience becomes organisational knowledge that enhances strategic development; and Ecosystem Integration Evolution revealing how individual enterprise enhancement connects with broader ecosystem resilience. These mechanisms operate through a matrix relationship

where horizontal progression represents temporal development across crisis phases while vertical progression represents capability development processes that span all phases, creating capability compounding effects that enable antifragile organisational development.

The development has established a paradigmatic shift from traditional crisis management frameworks emphasising survival and recovery to approaches that recognise extreme conditions as catalysts for organisational transformation and strategic enhancement. The empirical evidence has consistently demonstrated that high-growth SMEs do not merely survive crisis conditions but emerge transformed with enhanced capabilities, strategic positioning, and competitive advantages that exceed their pre-crisis potential, providing systematic evidence of antifragile organisational development. This transformation challenges fundamental assumptions underlying crisis management literature, which predominantly focuses on resilience, recovery, and return to normalcy, instead revealing how enterprises can leverage crisis conditions to accelerate capability development, strategic innovation, and competitive positioning in ways that would be difficult or impossible under normal operational conditions.

The chapter has uncovered significant evidence that ethical considerations and value-based decision-making can enhance rather than constrain strategic effectiveness under extreme conditions, challenging fundamental assumptions about trade-offs between ethical behaviour and competitive performance. The analysis has demonstrated how values function as cognitive anchors during extreme uncertainty, providing decision-making frameworks that enable strategic coherence when traditional planning approaches become inadequate, while revealing how consistent value expression during challenging conditions creates strategic resources through stakeholder relationship development, competitive differentiation, and strategic authenticity. The evidence has shown how value-based approaches create sustainable competitive advantages through stakeholder confidence and relationship development, positioning ethics as strategic capability rather than external constraint on strategic action.

The chapter's unique analytical contribution centres on the identification and systematic analysis of temporal learning accumulation processes that enable progressive capability enhancement across crisis phases. Unlike previous research examining crisis response as discrete events, this investigation has revealed how crisis management capabilities develop

through sustained exposure and learning integration across multiple temporal phases, creating developmental trajectories that transform organisational potential permanently. Each phase has built upon previous learning while creating new challenges that required enhanced capabilities and strategic sophistication, demonstrating crisis management as an accelerated learning process that compresses normal organisational development timelines while enabling enterprises to develop strategic confidence through successful crisis management while maintaining preparation for continued uncertainty.

The analysis has revealed an important dimension of crisis management that extends beyond individual enterprise adaptation to encompass collaborative ecosystem development and collective resilience building, demonstrating how individual enterprise crisis management success contributes to broader ecosystem resilience while creating strategic positioning advantages through knowledge sharing, collaborative problem-solving, and mutual learning. This collaborative dimension has challenged competitive assumptions in strategic management literature by showing how collective capability development can enhance individual competitive positioning through ecosystem contribution and shared learning, with enterprises that developed superior institutional relationships achieving enhanced resource access and strategic development support through collaborative engagement that created mutual value beyond simple resource transfer.

The chapter has documented sophisticated patterns of capability evolution across the five crisis phases, revealing how enterprises developed increasingly complex strategic approaches that balanced multiple competing priorities and temporal horizons simultaneously, progressing from initial cognitive disruption through strategic adaptation, capability integration, enhanced development, and ultimately crisis mastery. This evolution has challenged assumptions about crisis management as defensive activity, instead revealing creative problem-solving, strategic transformation, and organisational development that enhanced long-term competitive positioning. The analysis has also revealed sophisticated resource innovation capabilities that created lasting competitive advantages through strategic resource development rather than simple crisis adaptation, with enterprises demonstrating resource orchestration capabilities that leveraged crisis learning to create strategic positioning advantages while showing how extreme resource constraints stimulated

creative resource utilisation that created new capabilities exceeding normal resource abundance outcomes.

Through detailed examination of six enterprise journeys across five crisis phases and comprehensive thematic analysis integrated into the Crisis Management Capability Development Model, this chapter has provided robust empirical foundation for advancing crisis management theory while offering practical insights for SME practitioners facing extreme uncertainty. The findings establish clear evidence that crisis conditions, when effectively navigated, can serve as catalysts for organisational development that transforms enterprise capabilities, strategic positioning, and competitive advantages in ways that create lasting value beyond simple crisis survival. The systematic temporal analysis has fundamentally reconceptualised crisis management from defensive survival activity to strategic transformation opportunity, revealing how high-growth SMEs can emerge stronger from extreme uncertainty through sophisticated capability development and strategic enhancement, while demonstrating that successful crisis navigation requires viewing extreme conditions as accelerated organisational development opportunities rather than simply challenges to be overcome.

Chapter seven: Conclusion

Introduction

This concluding chapter synthesises the comprehensive empirical and theoretical insights generated through this longitudinal investigation of crisis management capability development in high-growth potential Scottish SMEs during the COVID-19 pandemic from March 2020 to March 2021. The research attempted to contribute and challenged existing paradigms in crisis management literature, which have traditionally emphasised damage control and recovery (Pearson & Clair, 1998; Coombs, 2007), instead demonstrating through rigorous empirical analysis how sustained crisis exposure can enable organisational transformation that exceeds pre-crisis potential through capability development and strategic enhancement.

This investigation represents a departure from traditional crisis management frameworks that conceptualise crisis primarily as threatening events requiring defensive responses (Boin et al., 2005; Bundy et al., 2017). Instead, the research has provided robust empirical validation of organisational development through systematic documentation of enhancement processes during extreme uncertainty conditions. The findings demonstrate that high-growth SMEs can achieve genuine antifragile development, thus becoming stronger, more capable, and better positioned through adversity exposure rather than simply maintaining stability or recovering from disruption.

The research has addressed critical theoretical gaps in crisis management literature through innovative methodological approaches that captured real-time organisational development during actual crisis conditions rather than relying on retrospective reconstruction potentially influenced by hindsight bias and memory limitations (Eisenhardt, 1989; Yin, 2018). The longitudinal design enabled novel insight into temporal development processes through which crisis management capabilities evolve, revealing learning accumulation and enhancement mechanisms that cross-sectional research designs cannot adequately address (Langley, 1999; Pettigrew, 1990).

This investigation's focus on high-growth potential SMEs within Scotland's institutional context has provided renewed understanding of how resource-constrained, entrepreneurial enterprises navigate extreme uncertainty whilst potentially achieving competitive advantages through creative constraint utilisation and collaborative relationship development (Baker & Nelson, 2005; Sarasvathy, 2001). The research demonstrates that SME structural characteristics, often perceived as limitations in strategic management literature (Penrose, 1959; Barney, 1991), can create distinctive advantages for uncertainty navigation that exceed capabilities typically associated with larger organisations.

This conclusion presents a comprehensive synthesis of research contributions, examining theoretical implications for crisis management scholarship, practical recommendations for SME practitioners and institutional support providers, methodological contributions for investigating organisational phenomena under extreme uncertainty, and directions for future research building upon these foundations. The chapter demonstrates how this investigation has advanced understanding of crisis management as a dynamic capability development process enabling organisational enhancement rather than simply threat mitigation (Teece, 2007; Eisenhardt & Martin, 2000), whilst establishing new theoretical frameworks for comprehending SME-specific advantages in uncertainty navigation.

Synthesis of Key Research Findings

The Crisis Management Capability Development Model

The research's most significant contribution involves the development of a comprehensive *Crisis Management Capability Development Model* that synthesises empirical findings into an integrated theoretical framework explaining how high-growth SMEs achieve antifragile organisational development through sustained crisis exposure. This model encompasses five interconnected mechanisms operating simultaneously across the identified temporal phases: *cognitive development trajectory* enabling sense-making evolution from disruption to environmental construction (Weick, 1995; Maitlis & Christianson, 2014), *value-resource integration* synthesising ethical frameworks with strategic resource management (Alpaslan et al., 2009; Hart & Sharma, 2004), *resource innovation acceleration* whereby constraints stimulate creative utilisation for competitive advantages (Baker & Nelson, 2005; Senyard et

al., 2014), *learning accumulation* processes involving systematic capture and integration of crisis experience for strategic enhancement (Teece, 2007; Zollo & Winter, 2002), and *ecosystem integration evolution* progressing from individual management to collaborative ecosystem development (Moore, 1993; Adner, 2017).

These mechanisms interact through mutual reinforcement patterns where development in one dimension enables and accelerates development in others, creating capability compounding effects that distinguish antifragile development from simple resilience frameworks (Holling, 1973; Folke, 2006) or recovery approaches (Coombs, 2007; Mitroff & Alpaslan, 2003). The temporal dimension proved crucial for understanding these interactions, as capability development occurred through accumulated experience rather than discrete adaptive responses to specific crisis events, validating process theories of organisational development (Van de Ven & Poole, 1995; Langley et al., 2013).

The model demonstrates that crisis management effectiveness emerges through sustained practice and iterative learning rather than formal training or predetermined planning frameworks, challenging fundamental assumptions in traditional crisis management literature about optimal preparation and response approaches (Quarantelli, 1988; Turner, 1976). This finding supports effectuation logic (Sarasvathy, 2001, 2008) whilst extending it through systematic documentation of how means-driven action under uncertainty creates enhanced organisational capabilities rather than simply enabling survival.

The integration of cognitive, strategic, operational, and collaborative dimensions within this model addresses fragmentation in existing literature that has treated these domains as separate phenomena requiring distinct analytical frameworks (Bundy et al., 2017; Williams et al., 2017). The research reveals how sense-making sophistication enables strategic adaptation effectiveness (Weick, 1995), whilst strategic flexibility enhances resource innovation capability (Eisenhardt & Martin, 2000), and resource creativity supports collaborative relationship development that strengthens cognitive processing through diverse information sources and stakeholder engagement opportunities (Nahapiet & Ghoshal, 1998).

Additionally, the investigation has identified a shift in crisis management thinking from defensive frameworks emphasising survival and recovery (Pearson & Clair, 1998; Mitroff,

2005) toward transformational approaches recognising extreme uncertainty as catalyst for organisational enhancement. This shift challenges core assumptions in crisis management literature that treat crisis conditions as purely disruptive forces requiring mitigation rather than development opportunities enabling strategic advancement (Linnenluecke, 2017; Williams et al., 2017). This is where the research demonstrates that high-growth SMEs can achieve organisational enhancement that exceeds pre-crisis potential through effective uncertainty navigation, providing empirical validation of antifragile development. This empirical validation addresses the primarily theoretical nature of antifragile concepts whilst contributing concrete evidence for organisational transformation through adversity that transcends resilience frameworks emphasising stability maintenance (Holling, 1973) or adaptive capacity development (Folke, 2006).

This shift has profound implications for both theoretical development and practical crisis management approaches, suggesting that optimal crisis outcomes may involve transformation rather than simple restoration to pre-crisis states (Comfort, 2019; Boin & Lodge, 2016). The research reveals how crisis conditions can accelerate innovation cycles (Brown & Eisenhardt, 1997), force strategic clarity (Eisenhardt & Zbaracki, 1992), strengthen stakeholder relationships (Freeman et al., 2010), and enable capability development that creates lasting competitive advantages extending well beyond immediate crisis resolution. Additionally, the shift from survival to enhancement also reveals how traditional crisis management frameworks may systematically underestimate organisational potential for development through adversity whilst overemphasising defensive approaches that limit transformational possibilities (Christianson et al., 2009; Rerup, 2009). The research suggests that organisations adopting enhancement-oriented crisis management approaches may achieve superior long-term outcomes compared to those focused primarily on damage limitation and rapid recovery, though this proposition requires further empirical investigation across diverse crisis types and organisational contexts.

SME-Specific Synthesis and Values-Based Strategic Management

The research has identified distinctive SME advantages in crisis navigation that challenge traditional assumptions about resource constraints as purely limiting factors in strategic effectiveness (Barney, 1991; Peteraf, 1993). High-growth SMEs demonstrated superior

adaptability, innovation capability, and strategic flexibility compared to patterns typically associated with larger organisations, revealing how structural characteristics create competitive advantages rather than simply vulnerabilities during uncertainty navigation (Covin & Slevin, 1989; Wiklund & Shepherd, 2003).

These advantages include rapid decision-making capability through concentrated authority (Eisenhardt, 1989), entrepreneurial orientation enabling opportunity recognition within constraints (Shane & Venkataraman, 2000), informal network utilisation for resource access and information gathering (Uzzi, 1997), operational simplicity reducing complexity-related vulnerabilities and stakeholder proximity enabling authentic relationship development and collaborative problem-solving (Freeman et al., 2010). The research reveals how these characteristics, often viewed as limitations in strategic management literature, create distinctive crisis management capabilities that may exceed those available to larger, more resource-abundant organisations.

The research validates bricolage theory (Baker & Nelson, 2005; Levi-Strauss, 1967) whilst extending it through systematic documentation of constraint-advantage transformation mechanisms operating during extreme uncertainty. SMEs demonstrated remarkable capability for creative resource recombination, strategic partnership development, and innovative business model adaptation that enabled not merely survival but strategic enhancement during crisis conditions. This finding supports frugal innovation concepts (Radjou et al., 2012; Zeschky et al., 2011) whilst revealing how crisis conditions can accelerate creative resource utilisation beyond normal operational contexts.

Additionally, these findings challenge fundamental assumptions in strategic management literature about resource accumulation as prerequisite for competitive effectiveness (Barney, 1991; Grant, 1991), suggesting instead that creative resource utilisation may be more valuable than resource abundance for uncertainty navigation. The research demonstrates how SMEs can leverage structural characteristics and resource constraints to achieve strategic advantages that may be unavailable to larger organisations constrained by bureaucratic procedures, complexity management requirements, and stakeholder coordination challenges (Hannan & Freeman, 1984).

Perhaps the most counterintuitive finding involves the demonstration that ethical considerations and personal values enhance rather than constrain strategic effectiveness during crisis conditions, fundamentally challenging assumptions about trade-offs between ethical behaviour and competitive performance under extreme uncertainty (Friedman, 1970; Jensen, 2002). The research reveals how values-based decision-making provided cognitive stability, stakeholder relationship advantages, and competitive differentiation that contributed to strategic effectiveness rather than limiting crisis opportunism or constraining resource utilisation approaches.

Values functioned as strategic frameworks enabling coherent action during cognitive overload (Kahneman, 2011) whilst creating stakeholder trust and engagement that provided access to resources, information, and collaborative opportunities unavailable through purely transactional approaches (Jones, 1995; Phillips et al., 2003). The integration of ethical considerations with strategic decision-making created authentic positioning that strengthened rather than constrained competitive effectiveness, demonstrating how values can function as strategic assets rather than external constraints on strategic action (Hart & Sharma, 2004; Porter & Kramer, 2011).

This finding has significant implications for both crisis management theory and broader strategic management scholarship, suggesting that the traditional assumption about ethical behaviour as luxury consideration during survival periods (Maslow, 1943) may systematically misrepresent the relationship between values and strategic effectiveness. The research demonstrates how values-based approaches may create sustainable competitive advantages through stakeholder relationship development, reputational positioning, and organisational coherence that enhance rather than limit strategic flexibility and resource access capabilities (Freeman et al., 2010). This further extend knowledge that crisis conditions can intensify stakeholder relationship importance whilst creating opportunities for authentic values demonstration that strengthens collaborative partnerships.

Temporal Learning Accumulation

The longitudinal investigation revealed sophisticated temporal learning accumulation processes through which sustained crisis exposure created progressive capability

enhancement rather than simple adaptation to specific threatening events. Crisis management capabilities evolved through the five identified phases characterised by increasing sophistication in environmental scanning, strategic decision-making, resource utilisation, and stakeholder relationship management, demonstrating that uncertainty navigation effectiveness develops through accumulated experience rather than formal preparation or training programmes (Kolb, 1984; Argyris & Schön, 1978).

The temporal dimension proved crucial for understanding capability development mechanisms, as enhancement occurred through iterative learning cycles rather than discrete adaptive responses (Levitt & March, 1988; Huber, 1991). Each phase contributed specific learning elements whilst building upon previous phase achievements, creating cumulative capability development that exceeded simple recovery or resilience frameworks. The research demonstrates how sustained uncertainty exposure can create organisational memory and interpretive sophistication that provide strategic advantages for future challenge navigation, validating dynamic capabilities theory (Teece, 2007) whilst extending it through documentation of crisis-specific capability development patterns.

This temporal perspective challenges assumptions in crisis management literature about crisis as discrete events requiring specific responses (Turner, 1976; Quarantelli, 1988), instead revealing crisis navigation as ongoing developmental process enabling progressive enhancement through accumulated learning and capability refinement. The investigation suggests that organisations should approach extended uncertainty periods as development opportunities rather than challenges to overcome, fundamentally reframing crisis management from episodic response toward continuous capability building and strategic enhancement.

The research validates experiential learning theory (Kolb, 1984) that was not explicitly reviews in this thesis yet demonstrating how crisis conditions accelerate learning cycles through compressed feedback loops, heightened attention, and consequence clarity that enhance learning effectiveness beyond normal operational contexts. This finding supports theories of organisational learning under extreme conditions (Christianson et al., 2009; Madsen & Desai, 2010) whilst revealing specific mechanisms through which uncertainty navigation becomes embedded organisational capability rather than temporary adaptation.

Theoretical Contributions and Research Implications

Integration of Fragmented Theoretical Domains

This research has made substantial contributions to theoretical integration across previously fragmented domains of crisis management (Bundy et al., 2017), sense-making (Weick, 1995), strategic adaptation (Eisenhardt & Martin, 2000), resource innovation (Baker & Nelson, 2005), resilience (Holling, 1973), and antifragility (Taleb, 2012) literatures. The investigation demonstrates how these theoretical frameworks operate synergistically during uncertainty navigation rather than independently, creating integrated understanding that transcends individual theoretical contributions whilst revealing interaction effects and mutual reinforcement patterns that existing literature has not adequately addressed.

The Crisis Management Capability Development Model provides comprehensive framework integrating Weick's (1995) sense-making properties with Sarasvathy's (2001, 2008) effectuation principles, Baker and Nelson's (2005) bricolage theory, Teece's (2007) dynamic capabilities framework, and Taleb's (2012) antifragility concepts within SME-specific contexts. This integration addresses theoretical fragmentation whilst demonstrating how multiple frameworks contribute simultaneously to uncertainty navigation effectiveness, creating synergistic explanatory power that exceeds individual theoretical applications.

The research contributes methodological insights for theoretical integration through demonstration of how longitudinal process research can capture complex interactions between theoretical mechanisms operating simultaneously across temporal dimensions (Langley, 1999; Van de Ven & Poole, 1995). This methodological approach enables understanding of theoretical integration as dynamic process rather than static analytical framework, revealing how different theoretical elements become prominent during different developmental phases whilst maintaining continuous interaction effects throughout capability development processes.

The research demonstrates how natural experiments created by global crisis events can provide unique research opportunities for comparative analysis across diverse organisational contexts under controlled external conditions, maximising analytical rigour whilst maintaining ecological validity and real-world relevance (Cook & Campbell, 1979). The COVID-19

pandemic's simultaneous impact across economic sectors enabled investigation of organisational responses across diverse contexts under consistent external conditions, providing analytical control difficult to achieve through typical organisational research approaches.

The longitudinal design with monthly data collection frequency provided a suitable framework for capturing gradual changes and developmental processes requiring sustained observation periods, contributing to process research methodology advancement for investigating complex organisational phenomena characterised by temporal development and iterative learning (Langley, 1999; Pettigrew, 1990). This methodological approach enables understanding of capability development as temporal process rather than discrete events, revealing developmental characteristics that might be overlooked through snapshot approaches or retrospective analysis.

Practical Implications and Recommendations

Strategic Guidance for SME Practitioners

The investigation has made substantial contributions to SME and entrepreneurship literature through systematic documentation of distinctive advantages that smaller enterprises possess for uncertainty navigation, challenging traditional assumptions about resource constraints as purely limiting factors whilst revealing how structural characteristics create competitive advantages under specific uncertainty conditions (Baker & Nelson, 2005; Shane & Venkataraman, 2000). The research demonstrates how entrepreneurial orientation (Covin & Slevin, 1989), structural simplicity (Mintzberg, 1979), and resource constraints can create innovation capabilities and strategic flexibility that exceed larger organisation capabilities under uncertainty conditions, contributing to entrepreneurship literature through empirical validation of entrepreneurial advantages whilst extending understanding of how these advantages operate specifically during crisis conditions. This contribution has implications for entrepreneurship education, policy development, and institutional support frameworks.

The investigation also contributes understanding of how institutional support systems can enhance rather than constrain entrepreneurial capabilities, revealing collaborative frameworks that maintain SME autonomy whilst providing access to resources and expertise.

This contribution addresses gaps in literature regarding ecosystem-level entrepreneurship whilst demonstrating how individual enterprise effectiveness contributes to broader economic resilience through collaborative development and knowledge sharing (Moore, 1993).

Therefore, this research provides evidence-based strategic guidance for SME practitioners seeking to develop crisis management capabilities whilst challenging traditional assumptions about optimal crisis preparation and response approaches. The investigation demonstrates that crisis management effectiveness emerges through sustained practice and iterative learning rather than formal planning or comprehensive resource accumulation, suggesting that SMEs should focus on developing adaptive capabilities rather than attempting to predict and prepare for specific crisis scenarios (Eisenhardt & Martin, 2000).

SME practitioners should approach extended uncertainty periods as development opportunities rather than challenges to overcome, actively seeking experiences that build uncertainty navigation capabilities whilst developing systematic processes for capturing and integrating learning from challenging conditions. The research suggests that SMEs can achieve competitive advantages through creative constraint utilisation (Baker & Nelson, 2005), values-based strategic positioning (Freeman et al., 2010), and collaborative relationship development that leverage structural characteristics rather than attempting to overcome resource limitations through traditional resource accumulation approaches (Barney, 1991).

The investigation recommends that SMEs develop digital infrastructure capabilities, revenue stream diversification, network relationship investment, and values clarification as foundational elements for crisis management effectiveness. These capabilities provide operational resilience whilst creating cognitive advantages through multiple environmental scanning sources, collaborative problem-solving opportunities, and decision-making frameworks that enable coherent action during uncertainty periods when analytical approaches may prove inadequate (Kahneman, 2011).

SMEs should recognise that crisis management capabilities develop through temporal learning accumulation rather than discrete training activities, suggesting that organisations could potentially get involved in various ‘outside the comfort zone’ conditions whilst building

systematic reflection and learning integration processes (Kolb, 1984). The research demonstrates that sustained uncertainty exposure can create organisational memory and interpretive sophistication providing strategic advantages for future challenge navigation, indicating that SMEs should view crisis conditions as capability development investments rather than simply costs to be minimised.

Policy Recommendations for Institutional Support Systems

The research provides insights for policymakers and institutional support providers about effective approaches to enhancing ecosystem-level resilience through collaborative crisis management frameworks that maintain SME entrepreneurial advantages whilst providing access to resources and expertise typically unavailable to smaller enterprises. The investigation reveals how institutional relationships can enhance individual enterprise capabilities whilst contributing to broader ecosystem resilience through knowledge sharing, resource coordination, and collaborative problem-solving approaches (Moore, 1993).

Institutional support systems should adopt flexible, responsive approaches that complement rather than constrain SME adaptability and entrepreneurial orientation, providing resources and guidance that enhance rather than replace indigenous crisis management capabilities. The research further suggests that institutional support is most effective when it functions as collaborative partnership development rather than prescriptive guidance provision, enabling SMEs to maintain autonomous decision-making whilst accessing external resources and expertise when needed (Brown & Mason, 2017).

Policy frameworks should recognise and leverage distinctive SME advantages in uncertainty navigation rather than attempting to impose large organisation crisis management approaches that may be inappropriate for smaller enterprise contexts. The investigation demonstrates that SMEs possess inherent capabilities for rapid adaptation, creative resource utilisation, and stakeholder relationship development that can contribute to broader economic resilience when effectively supported and coordinated through appropriate institutional frameworks.

The research recommends development of collaborative platforms enabling knowledge sharing and resource coordination among SMEs whilst maintaining competitive independence and entrepreneurial autonomy. These platforms should facilitate access to expertise, funding opportunities, and collaborative partnerships whilst avoiding bureaucratic constraints that might limit SME adaptability and innovation capabilities during uncertainty periods.

Organisational Development and Capability Building

The research demonstrates that organisations can develop sophisticated crisis management capabilities through intentional practice with challenging conditions rather than simply reacting to crisis events when they occur (Teece, 2007). Organisations should develop comprehensive environmental scanning capabilities through diverse information sources and stakeholder networks that provide early warning systems whilst creating collaborative relationships that enable rapid resource access and problem-solving support during uncertainty periods. The research suggests that environmental scanning effectiveness depends more on network diversity and relationship quality than formal analytical frameworks, indicating that organisations should invest in relationship development as strategic asset for uncertainty navigation (Nahapiet & Ghoshal, 1998).

The investigation recommends systematic values clarification and integration with strategic decision-making frameworks, recognising that ethical considerations can enhance rather than constrain competitive effectiveness through stakeholder relationship development, reputational positioning, and organisational coherence. Organisations should develop explicit values frameworks that provide decision-making guidance during uncertainty periods whilst creating authentic positioning that strengthens stakeholder engagement and collaborative opportunities (Freeman et al., 2010).

Additionally, organisations should develop systematic learning capture and integration processes that enable accumulated experience to enhance future uncertainty navigation capabilities rather than simply resolving immediate challenges. The research demonstrates that temporal learning accumulation creates organisational memory providing strategic advantages for future challenge navigation, suggesting that systematic reflection and learning

integration represent crucial investments in uncertainty navigation capability development (Zollo & Winter, 2002).

Research Limitations and Boundary Conditions

Contextual and Geographic Constraints

This investigation focused specifically on high-growth potential Scottish SMEs operating within particular regional contexts that may limit transferability to other geographic locations, institutional frameworks, or cultural contexts characterised by different support systems, regulatory environments, or approaches to crisis management and entrepreneurial development. Scotland's institutional landscape, including organisations such as Highlands and Islands Enterprise and Scottish Enterprise, provides unique support frameworks that may not be available in other contexts, potentially limiting the generalisability of findings regarding collaborative crisis management and institutional relationship development (Huggins & Williams, 2011).

The research concentrated on enterprises within specific sectoral contexts including technology, food production, engineering, creative industries, and construction, which may limit transferability to other sectors characterised by different market dynamics, regulatory requirements, operational constraints, or stakeholder relationship patterns. The sectoral diversity within the sample provided cross-sectoral analysis capabilities whilst potentially limiting depth of understanding about sector-specific crisis management approaches that might reveal additional insights about contextual influences on capability development.

The focus on high-growth potential SMEs supported by institutional development programmes may limit transferability to other SME categories including lifestyle businesses, survival-oriented ventures, or enterprises without growth aspirations or institutional relationships. These enterprises may demonstrate different crisis management characteristics, capability development patterns, or strategic orientations that could provide alternative insights about SME uncertainty navigation whilst potentially revealing different mechanisms for achieving resilience or enhancement through adversity exposure (Storey, 1994).

Temporal and Crisis-Specific Limitations

The investigation covered the specific period from March 2020 to March 2021, capturing intensive crisis development during the COVID-19 pandemic but not extending to longer-term post-crisis evolution, sustained capability validation, or continued antifragile development that might provide additional insights about capability persistence, strategic advantage maintenance, or continued organisational enhancement beyond immediate crisis resolution. Extended longitudinal investigation might reveal whether crisis-developed capabilities provide lasting strategic advantages or require continuous reinforcement through ongoing challenge exposure (Teece, 2007).

The research focused specifically on the COVID-19 pandemic as unique crisis context characterised by global scope, extended duration, health dimensions, and simultaneous impact across economic sectors, which may not generalise to other crisis types characterised by different uncertainty profiles, impact patterns, sectoral effects, or temporal dynamics. Different crisis characteristics might reveal alternative capability development patterns, strategic adaptation requirements, or enhancement mechanisms that could extend or modify theoretical frameworks developed through this investigation (Turner, 1976).

The pandemic's unprecedented characteristics, including widespread institutional support provision, collaborative response expectations, and extended uncertainty duration, created unique conditions that may not characterise other crisis contexts. Future crisis events might involve different institutional responses, stakeholder relationship dynamics, or resource availability patterns that could influence capability development processes whilst revealing alternative mechanisms for uncertainty navigation and strategic enhancement.

Methodological Constraints

The investigation employed virtual interview data collection due to COVID-19 restrictions, which may have reduced nonverbal communication opportunities, observational insights, and contextual understanding that might have enhanced comprehension of participant experiences, organisational dynamics, and environmental conditions influencing crisis management approaches. Direct observational data collection might have provided

additional insights about actual decision-making processes, stakeholder interactions, and operational adaptations that could supplement interview-based understanding (Yin, 2018).

The research focused on owner-manager perspectives as primary data sources, which may have limited understanding of broader organisational experiences, stakeholder viewpoints, or alternative interpretations of crisis management effectiveness that could provide more comprehensive understanding of organisational development processes and capability evolution patterns. Multiple stakeholder perspectives might reveal different aspects of crisis management effectiveness whilst providing validation or alternative explanations for observed patterns (Eisenhardt, 1989).

The monthly interview frequency, whilst providing temporal resolution for capturing developmental processes, may have missed rapid changes or discrete events that occurred between data collection points, potentially underestimating the complexity and non-linearity of actual crisis navigation processes. More frequent data collection or participant self-reflective diary intakes might reveal additional developmental characteristics whilst capturing micro-processes contributing to capability evolution and strategic adaptation (Langley, 1999).

Directions for Future Research

Extended Longitudinal Investigation

Future research should extend longitudinal investigation beyond immediate crisis resolution to examine longer-term persistence of crisis-developed capabilities, sustained competitive advantages, and continued antifragile development through subsequent challenging conditions. Extended investigation could reveal whether crisis management capabilities require continuous reinforcement through ongoing challenge exposure or become embedded organisational competencies providing lasting strategic advantages (Teece, 2007). This research direction could validate the durability of crisis-developed capabilities whilst examining conditions under which temporary adaptations become permanent organisational characteristics.

Comparative longitudinal studies examining multiple crisis types across different temporal periods could reveal whether capability development patterns identified during the COVID-

19 pandemic generalise to other uncertainty contexts or represent pandemic-specific phenomena. Different crisis characteristics might reveal alternative development mechanisms whilst extending theoretical understanding of how various uncertainty types influence capability evolution and strategic enhancement possibilities (Turner, 1976; Boin et al., 2005).

Longitudinal investigation of unsuccessful crisis navigation cases could provide valuable insights about conditions under which crisis exposure leads to deterioration rather than enhancement, revealing boundary conditions for antifragile development whilst identifying risk factors that predict negative outcomes during uncertainty exposure. Understanding failure patterns could enhance theoretical frameworks whilst providing practical guidance for recognising and addressing vulnerability factors that constrain positive development through adversity (Madsen & Desai, 2010).

Comparative Analysis Across Organisational Contexts

Future research should examine crisis management capability development across different organisational sizes, structural characteristics, and developmental stages to understand how various organisational forms achieve uncertainty navigation effectiveness whilst identifying distinctive advantages and limitations associated with different organisational configurations. Comparative analysis could reveal whether SME advantages identified in this investigation translate to other organisational contexts or represent size-specific phenomena requiring different theoretical frameworks (Mintzberg, 1979).

Cross-cultural investigation could examine how different national, regional, or cultural contexts influence crisis management approaches, capability development patterns, and antifragile development possibilities, revealing cultural factors that facilitate or constrain enhancement through adversity whilst extending theoretical understanding beyond Western institutional contexts. Cultural variation studies could identify universal versus context-specific mechanisms in uncertainty navigation effectiveness (Hofstede, 2001). Sector-specific investigation could provide deeper understanding of how different industry characteristics, regulatory environments, market dynamics, and stakeholder relationship patterns influence crisis management approaches and capability development possibilities. Detailed sectoral

analysis could reveal industry-specific advantages and constraints whilst identifying transferable mechanisms that transcend sectoral boundaries (Porter, 1980).

Policy and Institutional Support Research

Future research should examine effectiveness of different institutional support approaches for enhancing ecosystem-level resilience whilst maintaining individual enterprise autonomy and entrepreneurial orientation. Comparative analysis of different support frameworks could identify optimal approaches for collaborative crisis management whilst avoiding bureaucratic constraints that might limit SME adaptability and innovation capabilities (Brown & Mason, 2017).

Investigation of ecosystem-level resilience development could examine how individual enterprise crisis management capabilities contribute to broader economic and social resilience whilst identifying synergistic effects that emerge through collaborative approaches to uncertainty navigation. This research direction could inform policy development whilst contributing to understanding of complex adaptive systems and network resilience (Holland, 1995). Research examining long-term institutional relationship evolution could reveal how crisis-induced collaborations develop into sustained partnerships whilst identifying factors that predict successful institutional engagement versus relationship deterioration following crisis resolution. Understanding institutional relationship dynamics could enhance support system effectiveness whilst informing policy frameworks for sustainable enterprise development support (Huggins & Williams, 2011).

Implications for Practice and Policy

Transforming Crisis Management Practice

The research findings have noteworthy implications for altering crisis management practice across multiple organisational contexts. The demonstration that crisis conditions can enable antifragile and overall organisational development rather than simply threatening survival fundamentally challenges traditional defensive approaches to crisis preparation and response (Quarantelli, 1988; Turner, 1976). Organisations should reconceptualise crisis management

from damage limitation activity toward capability development opportunity that can create lasting strategic advantages through systematic uncertainty navigation.

The investigation reveals that effective crisis management emerges through sustained practice and iterative learning rather than comprehensive planning or resource accumulation, suggesting that organisations should focus on developing adaptive capabilities rather than attempting to predict and prepare for specific crisis scenarios. These finding challenge traditional emergency management approaches that emphasise scenario planning and resource stockpiling whilst supporting approaches that build organisational flexibility and learning capabilities.

Additionally, the research demonstrates that values-based decision-making enhances rather than constrains strategic effectiveness during crisis conditions, indicating that organisations should integrate ethical considerations into crisis management frameworks rather than treating them as luxury considerations during survival periods. This integration can create stakeholder relationship advantages whilst providing cognitive frameworks that enable coherent action during uncertainty periods when analytical approaches may prove inadequate.

Regarding the reframing of SME support systems, this research provides crucial insights to recognise and leverage distinctive capabilities that smaller enterprises possess for uncertainty navigation rather than attempting to compensate for perceived limitations through traditional resource provision approaches. Institutional support providers should adopt collaborative partnership models that enhance rather than replace indigenous SME capabilities whilst providing access to resources and expertise when needed. Additionally, the research reveals that SME structural characteristics create competitive advantages for uncertainty navigation that may exceed those available to larger organisations, suggesting that support systems should build upon these advantages rather than attempting to transform SMEs into smaller versions of large corporations. Support frameworks should maintain SME adaptability and entrepreneurial orientation whilst providing collaborative platforms for knowledge sharing and resource coordination.

The investigation demonstrates that ecosystem-level resilience emerges through collaborative relationships among SMEs and institutional support providers, indicating that policy frameworks should facilitate network development and knowledge sharing whilst avoiding bureaucratic constraints that might limit SME innovation capabilities. This collaborative approach can enhance individual enterprise effectiveness whilst contributing to broader economic resilience through shared learning and resource coordination.

This thesis reveals that crisis management effectiveness emerges through temporal learning accumulation rather than discrete training activities, suggesting that development programmes should adopt longitudinal approaches that enable capability building through sustained practice rather than short-term interventions. This finding supports apprenticeship models and mentoring relationships that provide ongoing support for capability development over extended periods. This further demonstrates that values integration enhances strategic effectiveness whilst providing cognitive stability during uncertainty periods, indicating that educational programmes should address ethical frameworks as strategic resources rather than external constraints on business effectiveness. This integration can create authentic leadership capabilities whilst building stakeholder relationship competencies that provide strategic advantages.

Concluding Synthesis

Research Achievement and Contribution

This comprehensive investigation of crisis management capability development in high-growth potential Scottish SMEs during the COVID-19 pandemic has generated substantial theoretical, methodological, and practical contributions n crisis management literature. The research has demonstrated through rigorous longitudinal analysis that extreme uncertainty can serve as catalyst for organisational enhancement rather than simply threatening survival, providing empirical validation of antifragile development theory whilst establishing new theoretical frameworks for understanding SME-specific advantages in uncertainty navigation.

The Crisis Management Capability Development Model represents the investigation's central theoretical contribution, integrating fragmented theoretical domains whilst providing comprehensive framework explaining how sustained crisis exposure enables progressive

capability enhancement through temporal learning accumulation, values-resource integration, resource innovation acceleration, sense-making evolution, and ecosystem integration development. This model challenges fundamental assumptions about crisis management effectiveness whilst providing practical guidance for achieving enhancement through adversity exposure.

The research has established sustainable methodological approach for investigating organisational phenomena during extreme uncertainty through crisis-concurrent data collection approaches that capture developmental processes in real-time rather than relying on retrospective reconstruction. These methodological contributions provide frameworks for future research whilst demonstrating how natural experiments created by global crisis events can enable comparative analysis across diverse organisational contexts under controlled external conditions.

The research demonstrates that organisations adopting enhancement-oriented crisis management approaches may achieve superior long-term outcomes compared to those focused primarily on damage limitation and rapid recovery. This finding has implications for crisis management theory and practice whilst suggesting that traditional defensive approaches may systematically underestimate organisational potential for development through adversity. Additionally, these findings extend beyond crisis management to contribute broader understanding of how organisations can thrive under uncertainty conditions that increasingly characterise recent business environments.

This investigation encourages for continued research into organisational development under extreme uncertainty whilst contributing practical frameworks that enable enterprises to achieve strategic advantages through effective uncertainty navigation. The demonstration that high-growth SMEs can emerge stronger from crisis conditions through sophisticated capability development provides optimism for organisational resilience whilst challenging assumptions about crisis as purely disruptive force requiring defensive responses. The research further encourages for future investigation including extended longitudinal studies examining capability persistence beyond crisis resolution, comparative analysis across different organisational contexts and crisis types, mechanism validation through experimental approaches, and policy research examining ecosystem-level resilience

development. These research directions could strengthen theoretical understanding whilst expanding practical applications of antifragile development concepts.

Final Reflection

This research ultimately reveals that crisis conditions, when effectively navigated through systematic capability development and collaborative relationship building, can serve as transformational opportunities enabling organisational enhancement that creates lasting strategic advantages extending well beyond immediate crisis resolution. This insight reframes crisis management from reactive damage control toward proactive strategic development, opening new possibilities for achieving competitive effectiveness through adversity exposure whilst contributing to broader economic and social resilience through collaborative enhancement and knowledge sharing.

The investigation demonstrates that antifragile development represents achievable organisational aspiration rather than theoretical speculation, providing evidence-based pathways for transformation through adversity that benefit individual enterprises whilst contributing to broader economic resilience and sustainable development. The research establishes that organisations can systematically develop capabilities that enable not merely survival of uncertainty conditions but genuine enhancement through effective navigation of complex, challenging, and rapidly changing environmental conditions.

As the global economy continues to face unprecedented challenges including technological disruption, climate change impacts, geopolitical instability, and social transformation, the frameworks developed through this investigation provide crucial insights for building organisational capabilities that can thrive under uncertainty whilst contributing to sustainable economic development. The research demonstrates that the capacity for enhanced capability development exists within organisational systems, requiring only systematic cultivation through appropriate practices, relationships, and institutional support to enable transformation of adversity into opportunity for enhanced effectiveness and competitive positioning.

This investigation thus contributes not only to academic understanding of crisis management and organisational development but also to practical approaches for building resilient, adaptive, and ultimately antifragile organisational systems capable of creating value through uncertainty whilst contributing to broader social and economic flourishing under conditions of persistent change and challenge. The research establishes that crisis conditions, rather than representing threats to be overcome, can serve as catalysts for organisational transformation that enables enterprises to emerge stronger, more capable, and better positioned for sustained success in dynamic and uncertain environmental conditions.

Bibliography

Adam, N. A., & Alarifi, G. (2021). Innovation practices for survival of small and medium enterprises (SMEs) in the COVID-19 times: The role of external support. *Journal of Innovation and Knowledge*, 6(1), 31-42.

Adler, P. S., & Kwon, S. W. (2002). Social capital: Prospects for a new concept. *Academy of Management Review*, 27(1), 17-40.

Adner, R., 2017. Ecosystem as structure: An actionable construct for strategy. *Journal of management*, *43*(1), pp.39-58.

Aguilar, F. J. (1967). *Scanning the business environment*. Macmillan.

Alpaslan, C. M., Green, S. E., & Mitroff, I. I. (2009). Corporate governance in the context of crises: Towards a stakeholder theory of crisis management. *Journal of Contingencies and Crisis Management*, 17(1), 38-49.

Alvarez, S. A., & Barney, J. B. (2007). Discovery and creation: Alternative theories of entrepreneurial action. *Strategic Entrepreneurship Journal*, 1(1-2), 11-26.

Alves, J. C., Lok, T. C., Luo, Y., & Hao, W. (2022). Crisis leadership and sensemaking in Covid-19: The role of individual and collective leadership in crisis sense-making. *Frontiers in Psychology*, 13, 870246.

Amit, R., & Zott, C. (2012). Creating value through business model innovation. *MIT Sloan Management Review*, 53(3), 41-49.

Andersen, T. J. (2004). Integrating decentralized strategy making and strategic planning processes in dynamic environments. *Journal of Management Studies*, 41(8), 1271-1299.

Anderson, A. R., Dodd, S. D., & Jack, S. (2012). Entrepreneurship as connecting: Some implications for theorising and practice. *Management Decision*, 50(5), 958-971.

Anderson, P. (1999). Complexity theory and organization science. *Organization Science*, 10(3), 216-232.

Andrews, R., & Khoury, A. (2020). Frugal innovation in SMEs: A longitudinal study of the effects of financial constraints on innovation. *Small Business Economics*, 54(3), 725-742.

Argote, L., & Miron-Spektor, E. (2011). Organizational learning: From experience to knowledge. *Organization Science*, 22(5), 1123-1137.

Argyris, C., & Schön, D. A. (1978). *Organizational learning: A theory of action perspective*. Addison-Wesley.

Armstrong, C. E., & Shimizu, K. (2007). A review of approaches to empirical research on the resource-based view of the firm. *Journal of Management*, 33(6), 959-986.

Asheim, B. T., & Gertler, M. S. (2005). The geography of innovation: Regional innovation systems. In J. Fagerberg, D. C. Mowery, & R. R. Nelson (Eds.), *The Oxford handbook of innovation* (pp. 291-317). Oxford University Press.

Autio, E., Nambisan, S., Thomas, L. D., & Wright, M. (2018). Digital affordances, spatial affordances, and the genesis of entrepreneurial ecosystems. *Strategic Entrepreneurship Journal*, 12(1), 72-95.

Autio, E., Sapienza, H. J., & Almeida, J. G. (2000). Effects of age at entry, knowledge intensity, and imitability on international growth. *Academy of Management Journal*, 43(5), 909-924.

Baker, T., & Nelson, R. E. (2005). Creating something from nothing: Resource construction through entrepreneurial bricolage. *Administrative Science Quarterly*, 50(3), 329-366.

Balogun, J., & Johnson, G. (2004). Organizational restructuring and middle manager sensemaking. *Academy of Management Journal*, 47(4), 523-549.

Bapuji, H., & Crossan, M. (2020). From questions to answers: Reviewing organizational learning research. *Management Learning*, 35(4), 397-417.

Bapuji, H., & Crossan, M. M. (2020). History and organizational learning. *Management & Organizational History*, 15(2), 91-112.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120.

Barney, J. B., Arikan, A. M., Kroll, M., & Wright, P. (2021). Resource-based theory and strategic management. In D. J. Teece (Ed.), *The Palgrave Encyclopedia of Strategic Management* (pp. 1-7). Palgrave Macmillan.

Barton, L. (2001). *Crisis in organizations II* (2nd ed.). South-Western College Publishing.

Battisti, M., & Deakins, D. (2017). The relationship between dynamic capabilities, the firm's resource base and performance in a post-disaster environment. *International Small Business Journal*, 35(1), 78-98.

Baum, J. A., Calabrese, T., & Silverman, B. S. (2001). Don't go it alone: Alliance network composition and startups' performance in Canadian biotechnology. *Strategic Management Journal*, 21(3), 267-294.

Bebchuk, L. A., & Tallarita, R. (2020). The illusory promise of stakeholder governance. *Cornell Law Review*, 106(1), 91-178.

Beck, T., & Demirguc-Kunt, A. (2006). Small and medium-size enterprises: Access to finance as a growth constraint. *Journal of Banking & Finance*, 30(11), 2931-2943.

Bennett, N., & Lemoine, G. J. (2014). What a difference a word makes: Understanding threats to performance in a VUCA world. *Business Horizons*, 57(3), 311-317.

Bennett, N., Lemoine, G. J., & Hornby, J. (2022). Supply chain resilience and business performance during COVID-19: The role of supply chain efficiency, flexibility and collaborative sourcing. *International Journal of Operations & Production Management*, 42(3), 298-323.

Berger, P. L., & Luckmann, T. (1966). *The social construction of reality: A treatise in the sociology of knowledge*. Anchor Books.

Bhattacharya, S., & Patel, K. (2010). Frugal innovation and global health: The case of India. *Harvard Health Policy Review*, 11(1), 34-42.

Bhatti, Y., & Ventresca, M. (2013). How can 'frugal innovation' be conceptualized? *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2203552

Bingham, C. B., & Eisenhardt, K. M. (2011). Rational heuristics: The 'simple rules' that strategists learn from process experience. *Strategic Management Journal*, 32(13), 1437-1464.

Boin, A., & Lodge, M. (2016). Designing resilient institutions for transboundary crisis management: A time for public administration. *Public Administration*, 94(2), 289-298.

Boin, A., 't Hart, P., Stern, E., & Sundelius, B. (2005). *The politics of crisis management: Public leadership under pressure*. Cambridge University Press.

Bound, K., & Thornton, I. (2012). *Our frugal future: Lessons from India's innovation system*. Nesta.

Boxenbaum, E., & Rouleau, L. (2011). New knowledge products as bricolage: metaphors and scripts in organizational theory. *Academy of Management Review*, 36(2), 272-296.

Bradley, S. W., Wiklund, J., & Shepherd, D. A. (2011). Swinging a double-edged sword: The effect of slack on entrepreneurial management and growth. *Journal of Business Venturing*, 26(5), 537-554.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, 11(4), 589-597.

Brettel, M., Mauer, R., Engelen, A., & Küpper, D. (2012). Corporate effectuation: Entrepreneurial action and its impact on R&D project performance. *Journal of Business Venturing*, 27(2), 167-184.

Brown, R., & Mason, C. (2017). Looking inside the spiky bits: A critical review and conceptualisation of entrepreneurial ecosystems. *Small Business Economics*, 49(1), 11-30.

Brown, R., & Rocha, A. (2020). Entrepreneurial uncertainty during the Covid-19 crisis: Mapping the temporal dynamics of entrepreneurial finance. *Journal of Business Venturing Insights*, 14, e00174.

Brown, S. L., & Eisenhardt, K. M. (1997). The art of continuous change: Linking complexity theory and time-paced evolution in relentlessly shifting organizations. *Administrative Science Quarterly*, 42(1), 1-34.

Bundy, J., Pfarrer, M. D., Short, C. E., & Coombs, W. T. (2017). Crises and crisis management: Integration, interpretation, and research development. *Journal of Management*, 43(6), 1661-1692.

Burgelman, R. A. (1991). Intraorganizational ecology of strategy making and organizational adaptation: Theory and field research. *Organization Science*, 2(3), 239-262.

Burnard, K., & Bhamra, R. (2019). Challenges for organisational resilience. *Continuity & Resilience Review*, 1(1), 17-25.

Burnard, K., & Bhamra, R. (2019). Organisational resilience: Development of a conceptual framework for organisational responses. *International Journal of Production Research*, 49(18), 5581-5599.

Burrell, G., & Morgan, G. (1979). *Sociological paradigms and organisational analysis*. Heinemann.

Burt, R. S. (2005). *Brokerage and closure: An introduction to social capital*. Oxford University Press.

Burt, R. S. (2019). The network structure of social capital. *Research in Organizational Behavior*, 22, 345-423.

Cabinet Office. (2021). *COVID-19 response -- Spring 2021 (Roadmap)*. HM Government.

Chadwick, C., Super, J. F., & Kwon, K. (2015). Resource orchestration in practice: CEO emphasis on SHRM, commitment-based HR systems, and firm performance. *Strategic Management Journal*, 36(3), 360-376.

Chandler, G. N., DeTienne, D. R., McKelvie, A., & Mumford, T. V. (2011). Causation and effectuation processes: A validation study. *Journal of Business Venturing*, 26(3), 375-390.

Charmaz, K. (2014). *Constructing grounded theory* (2nd ed.). Sage Publications.

Christianson, M. K., Farkas, M. T., Sutcliffe, K. M., & Weick, K. E. (2009). Learning through rare events: Significant interruptions at the Baltimore & Ohio Railroad Museum. *Organization Science*, 20(5), 846-860.

Coad, A., Daunfeldt, S. O., Hölzl, W., Johansson, D., & Nightingale, P. (2014). High-growth firms: Introduction to the special section. *Industrial and Corporate Change*, 23(1), 91-112.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35(1), 128-152.

Collins, J. C., & Porras, J. I. (1994). *Built to last: Successful habits of visionary companies*. HarperBusiness.

Comfort, L. K. (2007). Crisis management in hindsight: Cognition, communication, coordination, and control. *Public Administration Review*, 67(s1), 189-197.

Comfort, L. K. (2019). *The dynamics of risk: Changing technologies and collective action in seismic events*. Princeton University Press.

Comfort, L. K., Sungu, Y., Johnson, D., & Dunn, M. (2001). Complex systems in crisis: Anticipation and resilience in dynamic environments. *Journal of Contingencies and Crisis Management*, 9(3), 144-158.

Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design & analysis issues for field settings*. Houghton Mifflin.

Cooke, P., Uranga, M. G., & Etxebarria, G. (1997). Regional innovation systems: Institutional and organisational dimensions. *Research Policy*, 26(4-5), 475-491.

Coombs, W. T. (2007). Protecting organization reputations during a crisis: The development and application of situational crisis communication theory. *Corporate Reputation Review*, 10(3), 163-176.

Coombs, W. T. (2019). *Ongoing crisis communication: Planning, managing, and responding* (5th ed.). Sage Publications.

Coombs, W. T., & Holladay, S. J. (2006). Unpacking the halo effect: Reputation and crisis management. *Journal of Communication Management*, 10(2), 123-137.

Cornelissen, J. P. (2017). Editor's comments: Developing propositions, a process model, or a typology? Addressing the challenges of writing theory without a boilerplate. *Academy of Management Review*, 42(1), 1-9.

Cornelissen, J. P., Mantere, S., & Vaara, E. (2020). The contraction of meaning: The combined effect of communication, emotions, and materiality on sensemaking in the Stockwell shooting. *Journal of Management Studies*, 51(5), 699-736.

Cornelissen, J. P., Mantere, S., & Vaara, E. (2020). The contraction and expansion of meaning: The dynamics of rhetorical sensemaking. *Academy of Management Review*, 45(4), 732-759.

Covin, J. G., & Slevin, D. P. (1989). Strategic management of small firms in hostile and benign environments. *Strategic Management Journal*, 10(1), 75-87.

Covin, J. G., & Slevin, D. P. (1991). A conceptual model of entrepreneurship as firm behavior. *Entrepreneurship Theory and Practice*, 16(1), 7-25.

Cowling, M., Brown, R., & Rocha, A. (2020). Did you save some cash for a rainy COVID-19 day? The crisis and SMEs. *International Small Business Journal*, 38(7), 593-604.

Cowling, M., Liu, W., & Ledger, A. (2015). Small business financing in the UK before and during the current financial crisis. *International Small Business Journal*, 30(7), 778-800.

Crossan, M. M., Lane, H. W., & White, R. E. (2011). An organizational learning framework: From intuition to institution. *Academy of Management Review*, 24(3), 522-537.

Crossan, M. M., Maurer, C. C., & White, R. E. (2011). Reflections on the 2009 AMR decade award: Do we have a theory of organizational learning? *Academy of Management Review*, 36(3), 446-460.

Cunha, M. P. E., Rego, A., Oliveira, P., Rosado, P., & Habib, N. (2014). Product innovation in resource-poor environments: Three research streams. *Journal of Product Innovation Management*, 31(2), 202-210.

Daft, R. L., & Weick, K. E. (1984). Toward a model of organizations as interpretation systems. *Academy of Management Review*, 9(2), 284-295.

Davidsson, P., Recker, J., & von Briel, F. (2020). External enablement of new venture creation: A framework. *Academy of Management Perspectives*, 34(3), 311-332.

Davidsson, P., von Briel, F., & Recker, J. (2022). Effectuation as a form of generative learning in innovation-driven entrepreneurship. In S. Read, N. Dew, S. D. Sarasvathy, M. Song, & R. Wiltbank (Eds.), *Handbook of effectuation research* (pp. 123-145). Edward Elgar Publishing.

Delmar, F., Davidsson, P., & Gartner, W. B. (2003). Arriving at the high-growth firm. *Journal of Business Venturing*, 18(2), 189-216.

Denzin, N. K., & Lincoln, Y. S. (2018). *The Sage handbook of qualitative research* (5th ed.). Sage Publications.

Derbyshire, J. (2016). The siren call of antifragility: A new mental model for navigating complex systems. *Technological Forecasting and Social Change*, 75, 89-102.

Desa, G., & Basu, S. (2013). Optimization or bricolage? Overcoming resource constraints in global social entrepreneurship. *Strategic Entrepreneurship Journal*, 7(1), 26-49.

Dew, N., Read, S., Sarasvathy, S. D., & Wiltbank, R. (2009). Effectual versus predictive logics in entrepreneurial decision-making: Differences between experts and novices. *Journal of Business Venturing*, 24(4), 287-309.

Doern, R. (2016). Entrepreneurship and crisis management: The experiences of small businesses during the London 2011 riots. *International Small Business Journal*, 34(3), 276-302.

Doern, R., Williams, N., & Vorley, T. (2019). Special issue on entrepreneurship and crises: Business as usual? An introduction and review of the literature. *Entrepreneurship & Regional Development*, 31(5-6), 400-412.

Doz, Y., & Kosonen, M. (2008). The dynamics of strategic agility: Nokia's rollercoaster experience. *California Management Review*, 50(3), 95-118.

Duchek, S. (2020). Organizational resilience: A capability-based conceptualization. *Business Research*, 13(1), 215-246.

Dutton, & R. E. Quinn (Eds.), *Positive organizational scholarship: Foundations of a new discipline* (pp. 94-110). Berrett-Koehler Publishers.

Dyer, J. H., & Singh, H. (1998). The relational view: Cooperative strategy and sources of interorganizational competitive advantage. *Academy of Management Review*, 23(4), 660-679.

Eggers, J. P., & Kaplan, S. (2013). Cognition and capabilities: A multi-level perspective. *Academy of Management Annals*, 7(1), 295-340.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, 14(4), 532-550.

Eisenhardt, K. M. (1989). Making fast strategic decisions in high-velocity environments. *Academy of Management Journal*, 32(3), 543-576.

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, 50(1), 25-32.

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, 21(10-11), 1105-1121.

Eisenhardt, K. M., & Zbaracki, M. J. (1992). Strategic decision making. *Strategic Management Journal*, 13(S2), 17-37.

Eisenhardt, K. M., Graebner, M. E., & Sonenshein, S. (2016). Grand challenges and inductive methods: Rigor without rigidity. *Academy of Management Journal*, 59(4), 1113-1123.

Elliott, D., & Smith, D. (2006). Cultural readjustment after crisis: Regulation and learning from crisis within the UK soccer industry. *Journal of Management Studies*, 43(2), 289-317.

Fabeil, N. F., Pazim, K. H., & Langgat, J. (2021). The impact of COVID-19 pandemic crisis on micro-enterprises: Entrepreneurs' perspective on business continuity and recovery strategy. *Journal of Economics and Business*, 3(2), 837-844.

Fassin, Y. (2008). SMEs and the fallacy of formalising CSR. *Business Ethics: A European Review*, 17(4), 364-378.

Felipe, C. M., Roldán, J. L., & Leal-Rodríguez, A. L. (2017). Impact of organizational culture values on organizational agility. *Sustainability*, 9(12), 2354.

Fisher, G. (2012). Effectuation, causation, and bricolage: A behavioral comparison of emerging theories in entrepreneurship research. *Entrepreneurship Theory and Practice*, 36(5), 1019-1051.

Folke, C. (2006). Resilience: The emergence of a perspective for social–ecological systems analyses. *Global Environmental Change*, 16(3), 253-267.

Folke, C., Carpenter, S. R., Walker, B., Scheffer, M., Chapin, T., & Rockström, J. (2010). Resilience thinking: Integrating resilience, adaptability and transformability. *Ecology and Society*, 15(4).

Food and Drink Federation. (2020). *Covid-19: The impact of the incident on food and drink manufacturing*. Food and Drink Federation.

Freeman, R. E., Harrison, J. S., Wicks, A. C., Parmar, B. L., & de Colle, S. (2010). *Stakeholder theory: The state of the art*. Cambridge University Press.

Freeman, R. E., Phillips, R., & Sisodia, R. (2018). Tensions in stakeholder theory. *Business & Society*, 59(2), 213-231.

Friedman, M. (1970). The social responsibility of business is to increase its profits. *The New York Times Magazine*, September 13, 1970.

Gartenberg, C., Prat, A., & Serafeim, G. (2019). Corporate purpose and financial performance. *Organization Science*, 30(1), 1-18.

Garud, R., Kumaraswamy, A., & Karnøe, P. (2011). Path dependence or path creation? *Journal of Management Studies*, 47(4), 760-774.

Gehman, J., Glaser, V. L., Eisenhardt, K. M., Gioia, D., Langley, A., & Corley, K. G. (2018). Finding theory–method fit: A comparison of three qualitative approaches to theory building. *Journal of Management Inquiry*, 27(3), 284-300.

Geissdoerfer, M., Vladimirova, D., & Evans, S. (2018). Sustainable business model innovation: A review. *Journal of Cleaner Production*, 198, 401-416.

George, G. (2005). Slack resources and the performance of privately held firms. *Academy of Management Journal*, 48(4), 661-676.

George, G., Howard-Grenville, J., Joshi, A., & Tihanyi, L. (2016). Understanding and tackling societal grand challenges through management research. *Academy of Management Journal*, 59(6), 1880-1895.

Gibbert, M., Hoegl, M., & Valikangas, L. (2007). In praise of resource constraints. *MIT Sloan Management Review*, 48(3), 15-17.

Giddens, A. (1984). *The constitution of society: Outline of the theory of structuration*. University of California Press.

Gioia, D. A., Patvardhan, S. D., Hamilton, A. L., & Corley, K. G. (2013). Organizational identity formation and change. *Academy of Management Annals*, 7(1), 123-193.

Giones, F., Brem, A., Pollack, J. M., Michaelis, T. L., Klyver, K., & Brinckmann, J. (2022). Revising entrepreneurial action in response to exogenous shocks: Considering the COVID-19 pandemic. *Journal of Business Venturing Insights*, 14, e00186.

Golden, B. R. (1992). The past is the past—or is it? The use of retrospective accounts as indicators of past strategy. *Academy of Management Journal*, 35(4), 848-860.

Granovetter, M. (2017). *Society and economy: Framework and principles*. Harvard University Press.

Grant, R. M. (1991). The resource-based theory of competitive advantage: Implications for strategy formulation. *California Management Review*, 33(3), 114-135.

Greenwood, R., Oliver, C., Lawrence, T., & Meyer, R. (Eds.). (2017). *The SAGE handbook of organizational institutionalism*. SAGE Publications.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105-117). Sage Publications.

Gunderson, L. H., & Holling, C. S. (Eds.). (2002). *Panarchy: Understanding transformations in human and natural systems*. Island Press.

Guo, H., Yang, Z., Huang, R., & Guo, A. (2020). The digitalization and public crisis responses of small and medium enterprises: Implications from a COVID-19 survey. *Frontiers of Business Research in China*, 14(1), 1-25.

Guo, R., Cai, L., & Fei, Y. (2016). How does knowledge management capability affect new product performance through effectuation? *Management Decision*, 54(10), 2610-2629.

Hannan, M. T., & Freeman, J. (1984). Structural inertia and organizational change. *American Sociological Review*, 49(2), 149-164.

Harari, D., & Keep, M. (2021). *Coronavirus: Economic impact*. House of Commons Library.

Harmeling, S., Moffett, J. W., Arnold, M. J., & Carlson, B. D. (2009). Service from the heart: understanding the heart of service through the service from the heart model. *Journal of Business Research*, 62(8), 765-772.

Hart, P., Rosenthal, U., & Kouzmin, A. (1993). Crisis decision making: The centralization thesis revisited. *Administration & Society*, 25(1), 12-45.

Hart, S. L., & Sharma, S. (2004). Engaging fringe stakeholders for competitive imagination. *Academy of Management Perspectives*, 18(1), 7-18.

Helfat, C. E., & Peteraf, M. A. (2015). Managerial cognitive capabilities and the microfoundations of dynamic capabilities. *Strategic Management Journal*, 36(6), 831-850.

Herbane, B. (2010). Small business research: Time for a crisis-based view. *International Small Business Journal*, 28(1), 43-64.

Herbane, B. (2019). Rethinking organizational resilience and strategic renewal in SMEs. *Entrepreneurship & Regional Development*, 31(5-6), 476-495.

Highlands and Islands Enterprise. (2021). *Annual report and accounts 2020-21*. HIE.

Hmieleski, K. M., & Baron, R. A. (2009). Entrepreneurs' optimism and new venture performance: A social cognitive perspective. *Academy of Management Journal*, 52(3), 473-488.

Hoegl, M., Gibbert, M., & Mazursky, D. (2008). Financial constraints in innovation projects: When is less more? *Research Policy*, 37(8), 1382-1391.

Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations*. Sage Publications.

Holland, J. H. (1995). *Hidden order: How adaptation builds complexity*. Addison-Wesley.

Hollensbe, E., Wookey, C., Hickey, L., George, G., & Nichols, C. V. (2014). Organizations with purpose. *Academy of Management Journal*, 57(5), 1227-1234.

Holling, C. S. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics*, 4(1), 1-23.

Holling, C. S. (1996). Engineering resilience versus ecological resilience. In P. C. Schulze (Ed.), *Engineering within ecological constraints* (pp. 31-44). National Academy Press.

Holt, R., & Cornelissen, J. P. (2014). Sensemaking revisited. *Management Learning*, 45(5), 525-539.

Hossain, M. U., & Akhter, F. (2022). SMEs in COVID-19 crisis and combating strategies: A systematic literature review (SLR) and future research agenda. *Strategic Change*, 31(1), 47-59.

Huber, G. P. (1991). Organizational learning: The contributing processes and the literatures. *Organization Science*, 2(1), 88-115.

Huber, G. P., & Power, D. J. (1985). Retrospective reports of strategic-level managers: Guidelines for increasing their accuracy. *Strategic Management Journal*, 6(2), 171-180.

Huggins, R., & Johnston, A. (2009). Knowledge networks in an uncompetitive region: SME innovation and growth. *Growth and Change*, 40(2), 227-259.

Huggins, R., & Williams, N. (2011). Entrepreneurship and regional competitiveness: The role and progression of policy. *Entrepreneurship & Regional Development*, 23(9-10), 907-932.

International Monetary Fund and World Bank. (2019). *List of LIC DSAs for PRGT-eligible countries*. IMF and World Bank.

International Monetary Fund. (2020). *The IMF's response to COVID-19*. IMF.

Jacobides, M. G., Cennamo, C., & Gawer, A. (2018). Towards a theory of ecosystems. *Strategic Management Journal*, 39(8), 2255-2276.

James, E. H., & Wooten, L. P. (2005). Leadership as (un)usual: How to display competence in times of crisis. *Organizational Dynamics*, 34(2), 141-152.

Jarzabkowski, P., & Kaplan, S. (2015). Strategy tools-in-use: A framework for understanding "technologies of rationality" in practice. *Strategic Management Journal*, 36(4), 537-558.

Jennings, P. D., & Greenwood, R. (2003). Constructing the iron cage: Institutional theory and enactment. In R. Westwood & S. Clegg (Eds.), *Debating organization: Point-counterpoint in organization studies* (pp. 195-207). Blackwell.

Jensen, M. C. (2002). Value maximization, stakeholder theory, and the corporate objective function. *Business Ethics Quarterly*, 12(2), 235-256.

Johnson, G. (1992). Managing strategic change—strategy, culture and action. *Long Range Planning*, 25(1), 28-36.

Jones, T. M. (1995). Instrumental stakeholder theory: A synthesis of ethics and economics. *Academy of Management Review*, 20(2), 404-437.

Jones, T. M., Harrison, J. S., & Felps, W. (2018). How applying instrumental stakeholder theory can provide sustainable competitive advantage. *Academy of Management Review*, 43(3), 371-391.

Juergensen, J., Guimón, J., & Narula, R. (2020). European SMEs amidst the COVID-19 crisis: Assessing impact and policy responses. *Journal of Industrial and Business Economics*, 47(3), 499-510.

Kahneman, D. (2011). *Thinking, fast and slow*. Farrar, Straus and Giroux.

Kapoor, R., & Lee, J. M. (2013). Coordinating and competing in ecosystems: How organizational forms shape new technology investments. *Strategic Management Journal*, 34(3), 274-296.

Kaptein, M. (2019). The battle for business ethics: A struggle theory. *Journal of Business Ethics*, 144(2), 343-361.

Kapucu, N., & Demiroz, F. (2017). Measuring performance for collaborative public management using network analysis methods and tools. *Public Performance & Management Review*, 34(4), 549-579.

Klein, V. B., & Todesco, J. L. (2021). COVID-19 crisis and SMEs responses: The role of digital transformation. *Knowledge and Process Management*, 28(2), 117-133.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice-Hall.

Kotter, J. P., & Heskett, J. L. (1992). *Corporate culture and performance*. Free Press.

Kraaijenbrink, J., Spender, J. C., & Groen, A. J. (2010). The resource-based view: A review and assessment of its critiques. *Journal of Management*, 36(1), 349-372.

Kraus, S., Breier, M., & Dasí-Rodríguez, S. (2021). The art of crafting a systematic literature review in entrepreneurship research. *International Entrepreneurship and Management Journal*, 16(3), 1023-1042.

Kraus, S., Clauss, T., Breier, M., Gast, J., Zardini, A., & Tiberius, V. (2020). The economics of COVID-19: Initial empirical evidence on how family firms in five European countries cope with the corona crisis. *International Journal of Entrepreneurial Behavior & Research*, 26(5), 1067-1092.

Kraus, S., Durst, S., Ferreira, J. J., Veiga, P., Kailer, N., & Weinmann, A. (2022). Digital transformation in business and management research: An overview of the current status quo. *International Journal of Information Management*, 63, 102466.

Kraus, S., Ferraris, A., & Bertello, A. (2022). The future of work: How innovation and digitalization re-shape the workplace. *Journal of Innovation & Knowledge*, 7(4), 100243.

Kuckertz, A., Berger, E. S., & Prochotta, A. (2022). Misfortune or fortune? How COVID-19 creates opportunities for entrepreneurship. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(1), 50.

Kuckertz, A., Brändle, L., Gaudig, A., Hinderer, S., Morales Reyes, C. A., Prochotta, A., Steinbrink, K. M., & Berger, E. S. (2020). Startups in times of crisis–A rapid response to the COVID-19 pandemic. *Journal of Business Venturing Insights*, 13

Kumar, N., Stern, L. W., & Anderson, J. C. (1993). Conducting interorganizational research using key informants. *Academy of Management Journal*, 36(6), 1633-1651.

Kvale, S., & Brinkmann, S. (2015). *InterViews: Learning the craft of qualitative research interviewing* (3rd ed.). Sage Publications.

Laasch, O. (2018). Beyond the purely commercial business model: Organizational value logics and the heterogeneity of sustainability business models. *Long Range Planning*, 51(1), 158-183.

Lampel, J., Shamsie, J., & Shapira, Z. (2009). Experiencing the improbable: Rare events and organizational learning. *Organization Science*, 20(5), 835-845.

Langley, A. (1999). Strategies for theorizing from process data. *Academy of Management Review*, 24(4), 691-710.

Langley, A., Smallman, C., Tsoukas, H., & Van de Ven, A. H. (2013). Process studies of change in organization and management: Unveiling temporality, activity, and flow. *Academy of Management Journal*, 56(1), 1-13.

Lavie, D., Lechner, C., & Singh, H. (2010). The performance implications of timing of entry and involvement in multipartner alliances. *Academy of Management Journal*, 53(6), 1335-1361.

Lee, S. H., Peng, M. W., & Barney, J. B. (2007). Bankruptcy law and entrepreneurship development: A real options perspective. *Academy of Management Review*, 32(1), 257-272.

Leih, S., & Teece, D. (2016). Campus leadership and the entrepreneurial university: A dynamic capabilities perspective. *Academy of Management Perspectives*, 30(2), 182-210.

Lengnick-Hall, C. A., Beck, T. E., & Lengnick-Hall, M. L. (2011). Developing a capacity for organizational resilience through strategic human resource management. *Human Resource Management Review*, 21(3), 243-255.

Levi-Strauss, C. (1967). *The savage mind*. University of Chicago Press.

Levitt, B., & March, J. G. (1988). Organizational learning. *Annual Review of Sociology*, 14(1), 319-338.

Linnenluecke, M. K. (2017). Resilience in business and management research: A review of influential publications and a research agenda. *International Journal of Management Reviews*, 19(1), 4-30.

Madsen, P. M., & Desai, V. (2010). Failing to learn? The effects of failure and success on organizational learning in the global orbital launch vehicle industry. *Academy of Management Journal*, 53(3), 451-476.

Maitlis, S. (2005). The social processes of organizational sensemaking. *Academy of Management Journal*, 48(1), 21-49.

Maitlis, S., & Christianson, M. (2014). Sensemaking in organizations: Taking stock and moving forward. *Academy of Management Annals*, 8(1), 57-125.

Maitlis, S., & Lawrence, T. B. (2007). Triggers and enablers of sensegiving in organizations. *Academy of Management Journal*, 50(1), 57-84.

Maitlis, S., & Sonenshein, S. (2010). Sensemaking in crisis and change: Inspiration and insights from Weick (1988). *Journal of Management Studies*, 47(3), 551-580.

Margolis, J. D., & Walsh, J. P. (2003). Misery loves companies: Rethinking social initiatives by business. *Administrative Science Quarterly*, 48(2), 268-305.

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50(4), 370-396.

McDonald, S., Daniels, K., & Harris, C. (2015). Cognitive mapping in organizational research: Emerging themes and future directions. In G. P. Hodgkinson & J. K. Ford (Eds.), *International review of industrial and organizational psychology* (pp. 201-233). Wiley.

McGrath, R. G. (1999). Falling forward: Real options reasoning and entrepreneurial failure. *Academy of Management Review*, 24(1), 13-30.

McKelvie, A., Haynie, J. M., & Gustavsson, V. (2011). Unpacking the uncertainty construct: Implications for entrepreneurial action. *Journal of Business Venturing*, 26(3), 273-292.

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). Sage Publications.

Miller, C. C., Cardinal, L. B., & Glick, W. H. (1997). Retrospective reports in organizational research: A reexamination of recent evidence. *Academy of Management Journal*, 40(1), 189-204.

Miller, D. (1983). The correlates of entrepreneurship in three types of firms. *Management Science*, 29(7), 770-791.

Miller, D., & Le Breton-Miller, I. (2005). *Managing for the long run: Lessons in competitive advantage from great family businesses*. Harvard Business School Press.

Mintzberg, H. (1978). Patterns in strategy formation. *Management Science*, 24(9), 934-948.

Mintzberg, H. (1979). *The structuring of organizations: A synthesis of the research*. Prentice-Hall.

Mintzberg, H. (1994). The rise and fall of strategic planning: Reconceiving roles for planning, plans, planners. *The Free Press*.

Mintzberg, H., & Waters, J. A. (1985). Of strategies, deliberate and emergent. *Strategic Management Journal*, 6(3), 257-272.

Mirabeau, L., & Maguire, S. (2014). From autonomous strategic behavior to emergent strategy. *Strategic Management Journal*, 35(8), 1202-1229.

Mitroff, I. I. (1988). *Crisis management: Cutting through the confusion*. *Sloan Management Review*, 29(2), 15-20.

Mitroff, I. I. (2005). *Why some companies emerge stronger and better from a crisis: 7 essential lessons for surviving disaster*. AMACOM.

Mitroff, I. I., & Alpaslan, M. C. (2003). Preparing for evil. *Harvard Business Review*, 81(4), 109-115.

Moore, J. F. (1993). Predators and prey: A new ecology of competition. *Harvard Business Review*, 71(3), 75-86.

Mosakowski, E. (2002). Overcoming resource disadvantages in entrepreneurial firms: When less is more. In M. A. Hitt, R. D. Ireland, S. M. Camp, & D. L. Sexton (Eds.), *Strategic entrepreneurship: Creating a new mindset* (pp. 106-126). Blackwell.

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23(2), 242-266.

Nahapiet, J., & Ghoshal, S. (2021). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23(2), 242-266.

Nambisan, S. (2017). Digital entrepreneurship: Toward a digital technology perspective of entrepreneurship. *Entrepreneurship Theory and Practice*, 41(6), 1029-1055.

Newbert, S. L. (2007). Empirical research on the resource-based view of the firm: An assessment and suggestions for future research. *Strategic Management Journal*, 28(2), 121-146.

OECD. (2018). *Global outlook on financing for sustainable development 2019: Time to face the challenge*. OECD Publishing.

OECD. (2020). *COVID-19 crisis response in Southeast European economies*. OECD Publishing.

OECD. (2020). *Economic outlook June 2020*. OECD Publishing.

OECD. (2020). *Government support and the Covid-19 pandemic*. OECD Publishing.

Office for National Statistics. (2021). *GDP quarterly national accounts, UK: July to September 2021*. ONS.

Office for National Statistics. (2022). *Coronavirus (COVID-19) latest insights: Infections*. ONS.

O'Reilly, C. A., & Tushman, M. L. (2008). Ambidexterity as a dynamic capability: Resolving the innovator's dilemma. *Research in Organizational Behavior*, 28, 185-206.

O'Reilly, C. A., & Tushman, M. L. (2013). Organizational ambidexterity: Past, present, and future. *Academy of Management Perspectives*, 27(4), 324-338.

Ori, D., Aldrighetti, R., Battini, D., Regattieri, A., & Zennaro, I. (2024). A comprehensive study of resilience in SMEs during COVID-19: An assessment tool for SME recovery. *International Journal of Production Research*, 62(8), 2765-2786.

Orlitzky, M., & Benjamin, J. D. (2001). Corporate social performance and firm risk: A meta-analytic review. *Business & Society*, 40(4), 369-396.

Orlitzky, M., Schmidt, F. L., & Rynes, S. L. (2003). Corporate social and financial performance: A meta-analysis. *Organization Studies*, 24(3), 403-441.

Pankaj, & Kumar, S. (2023). Analysing the impact of COVID-19 on SMEs and strategic business responses: A systematic literature review. *Benchmarking: An International Journal*, 30(2), 488-516.

Papadopoulos, T., Baltas, K. N., & Balta, M. E. (2020). The use of digital technologies by small and medium enterprises during COVID-19: Implications for theory and practice. *International Journal of Information Management*, 55, 102192.

Parmar, B. L., Freeman, R. E., Harrison, J. S., Wicks, A. C., Purnell, L., & de Colle, S. (2010). Stakeholder theory: The state of the art. *Academy of Management Annals*, 4(1), 403-445.

Patton, M. Q. (2015). *Qualitative research and evaluation methods: Integrating theory and practice* (4th ed.). Sage Publications.

Pauchant, T. C., & Mitroff, I. I. (1992). *Transforming the crisis-prone organization: Preventing individual, organizational, and environmental tragedies*. Jossey-Bass.

Pearson, C. M., & Clair, J. A. (1998). Reframing crisis management. *Academy of Management Review*, 23(1), 59-76.

Pearson, C. M., & Mitroff, I. I. (1993). From crisis prone to crisis prepared: A framework for crisis management. *Academy of Management Perspectives*, 7(1), 48-59.

Pedauga, L., Sáez, F., & Delgado-Márquez, B. L. (2022). Macroeconomic lockdown and SMEs: The impact of the COVID-19 pandemic in Spain. *Small Business Economics*, 58(2), 665-688.

Penrose, E. T. (1959). *The theory of the growth of the firm*. John Wiley.

Perry, J. T., Chandler, G. N., & Markova, G. (2012). Entrepreneurial effectuation: A review and suggestions for future research. *Entrepreneurship Theory and Practice*, 36(4), 837-861.

Peteraf, M. A. (1993). The cornerstones of competitive advantage: A resource-based view. *Strategic Management Journal*, 14(3), 179-191.

Peteraf, M., Di Stefano, G., & Verona, G. (2013). The elephant in the room of dynamic capabilities: Bringing two diverging conversations together. *Strategic Management Journal*, 34(12), 1389-1410.

Pettigrew, A. M. (1990). Longitudinal field research on change: Theory and practice. *Organization Science*, 1(3), 267-292.

Phillips, R., Freeman, R. E., & Wicks, A. C. (2003). What stakeholder theory is not. *Business Ethics Quarterly*, 13(4), 479-502.

Ployhart, R. E., & Vandenberg, R. J. (2010). Longitudinal research: The theory, design, and analysis of change. *Journal of Management*, 36(1), 94-120.

Porter, M. E. (1980). *Competitive strategy: Techniques for analyzing industries and competitors*. Free Press.

Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance*. Free Press.

Porter, M. E. (1996). What is strategy? *Harvard Business Review*, 74(6), 61-78.

Porter, M. E., & Kramer, M. R. (2011). Creating shared value. *Harvard Business Review*, 89(1-2), 62-77.

Powell, W. W. (1990). Neither market nor hierarchy: Network forms of organization. *Research in Organizational Behavior*, 12, 295-336.

Pozzebon, M. (2004). The influence of a structurationist view on strategic management research. *Journal of Management Studies*, 41(2), 247-272.

Prashantham, S., Eranova, M., & Couper, C. (2019). Globalization, entrepreneurship and paradox thinking. *Asia Pacific Journal of Management*, 35(1), 1-9.

Pratt, M. G., Kaplan, S., & Whittington, R. (2020). Editorial essay: The tumult over transparency: Decoupling transparency from replication in establishing trustworthy qualitative research. *Administrative Science Quarterly*, 65(1), 1-19.

Quarantelli, E. L. (1988). Disaster crisis management: A summary of research findings. *Journal of Management Studies*, 25(4), 373-385.

Quarantelli, E. L. (1998). *What is a disaster?: Perspectives on the question*. Routledge.

Quinn, J. B. (1980). *Strategies for change: Logical incrementalism*. Irwin.

Quinn, J. B. (1997). *Personal ethics and business ethics: The ethical attitudes of owner-managers of small business*. *Journal of Business Ethics*, 16(2), 119-127.

Radjou, N., & Prabhu, J. (2015). *Frugal innovation: How to do more with less*. The Economist Books.

Radjou, N., Prabhu, J., & Ahuja, S. (2012). *Jugaad innovation: Think frugal, be flexible, generate breakthrough growth*. Jossey-Bass.

Rae, D. (2000). Understanding entrepreneurial learning: A question of how? *International Journal of Entrepreneurial Behavior & Research*, 6(3), 145-159.

Rahmandad, H., Repenning, N., & Sterman, J. (2018). Effects of feedback delay on learning. *System Dynamics Review*, 25(4), 309-338.

Raisch, S., & Birkinshaw, J. (2008). Organizational ambidexterity: Antecedents, outcomes, and moderators. *Journal of Management*, 34(3), 375-409.

Ramezani, J., & Camarinha-Matos, L. M. (2020). Approaches for resilience and antifragility in collaborative business ecosystems. *Technological Forecasting and Social Change*, 151, 119846.

Ratten, V. (2023). The influence of the coronavirus (covid-19) pandemic on entrepreneurial innovation. *Journal of Small Business & Entrepreneurship*, 35(1), 90-115.

Ravasi, D., & Schultz, M. (2006). Responding to organizational identity threats: Exploring the role of organizational culture. *Academy of Management Journal*, 49(3), 433-458.

Read, S., Dew, N., Sarasvathy, S. D., Song, M., & Wiltbank, R. (2009). Marketing under uncertainty: The logic of an effectual approach. *Journal of Marketing*, 73(3), 1-18.

Read, S., Sarasvathy, S. D., Dew, N., & Wiltbank, R. (2016). *Effectual entrepreneurship*. Routledge.

Read, S., Song, M. and Smit, W., 2009. A meta-analytic review of effectuation and venture performance. *Journal of business venturing*, *24*(6), pp. 573-587.

Rerup, C. (2009). Attentional triangulation: Learning from unexpected rare crises. *Organization Science*, 20(5), 876-893.

Reymen, I. M., Andries, P., Berends, H., Mauer, R., Stephan, U., & Van Burg, E. (2015). Understanding dynamics of strategic decision making in venture creation: A process study of effectuation and causation. *Strategic Entrepreneurship Journal*, 9(4), 351-379.

Roberts, K. H. (1990). Some characteristics of one type of high reliability organization. *Organization Science*, 1(2), 160-176.

Rochlin, G. I. (1996). Reliable organizations: Present research and future directions. *Journal of Contingencies and Crisis Management*, 4(2), 55-59.

Rosenthal, U., Charles, M. T., & Hart, P. T. (Eds.). (1989). *Coping with crises: The management of disasters, riots and terrorism*. Thomas.

Runyan, R. C. (2006). Small business in the face of crisis: Identifying barriers to recovery from a natural disaster. *Journal of Contingencies and Crisis Management*, 14(1), 12-26.

Sandberg, J., & Tsoukas, H. (2015). Making sense of the sensemaking perspective: Its constituents, limitations, and opportunities for further development. *Journal of Organizational Behavior*, 36(S1), S6-S32.

Sarasvathy, S. D. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*, 26(2), 243-263.

Sarasvathy, S. D. (2008). *Effectuation: Elements of entrepreneurial expertise*. Edward Elgar Publishing.

Schaltegger, S., Lüdeke-Freund, F., & Hansen, E. G. (2016). Business models for sustainability: A co-evolutionary analysis of sustainable entrepreneurship, innovation, and transformation. *Organization & Environment*, 29(3), 264-289.

Schoemaker, P. J., Heaton, S., & Teece, D. (2018). Innovation, dynamic capabilities, and leadership. *California Management Review*, 61(1), 15-42.

Schwandt, T. A. (2000). Three epistemological stances for qualitative inquiry: Interpretivism, hermeneutics, and social constructionism. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 189-213). Sage Publications.

Scott, W. R. (2014). *Institutions and organizations: Ideas, interests, and identities*. Sage Publications.

Scottish Government. (2021). *Scottish annual business statistics 2021*. Scottish Government.

Senyard, J., Baker, T., Steffens, P., & Davidsson, P. (2014). Bricolage as a path to innovativeness for resource-constrained new firms. *Journal of Product Innovation Management*, 31(2), 211-230.

Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1), 217-226.

Shepherd, D. A., Williams, T. A., & Patzelt, H. (2015). Thinking about entrepreneurial decision making: Review and research agenda. *Journal of Management*, 41(1), 11-46.

Shrivastava, P. (1993). Crisis theory/practice: Towards a sustainable future. *Industrial & Environmental Crisis Quarterly*, 7(1), 23-42.

Simon, H. A. (1976). Administrative behavior: A study of decision-making processes in administrative organization (3rd ed.). Free Press.

Sirmon, D. G., Hitt, M. A., & Ireland, R. D. (2007). Managing firm resources in dynamic environments to create value: Looking inside the black box. *Academy of Management Review*, 32(1), 273-292.

Sirmon, D. G., Hitt, M. A., Ireland, R. D., & Gilbert, B. A. (2011). Resource orchestration to create competitive advantage: Breadth, depth, and life cycle effects. *Journal of Management*, 37(5), 1390-1412.

Smallbone, D., Deakins, D., Battisti, M., & Kitching, J. (2012). Small business responses to a major economic downturn: Empirical perspectives from New Zealand and the United Kingdom. *International Small Business Journal*, 30(7), 754-777.

Smircich, L., & Stubbart, C. (1985). Strategic management in an enacted world. *Academy of Management Review*, 10(4), 724-736.

Spence, L. J., & Rutherfoord, R. (2001). Social responsibility, profit maximisation and the small firm owner-manager. *Journal of Small Business and Enterprise Development*, 8(2), 126-139.

Spillan, J., & Hough, M. (2003). Crisis planning in small businesses: Importance, impetus and indifference. *European Management Journal*, 21(3), 398-407.

Stam, E., & Wennberg, K. (2009). The roles of R&D in new firm growth. *Small Business Economics*, 33(1), 77-89.

Starr, R., Newfrock, J., & Delurey, M. (2003). Enterprise resilience: Managing risk in the networked economy. *Strategy and Business*, 30, 70-79.

Stones, R. (2005). *Structuration theory*. Palgrave Macmillan.

Storey, D. J. (1994). *Understanding the small business sector*. Routledge.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Sage Publications.

Sutcliffe, K. M., & Vogus, T. J. (2003). Organizing for resilience. *Positive Organizational Scholarship: Foundations of a New Discipline*, 94-110.

Sutcliffe, K.M. and Vogus, T.J., 2014. Organizing for mindfulness. *The Wiley Blackwell handbook of mindfulness*, pp.407-423.

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12(2), 257-285.

Sweller, J., van Merriënboer, J. J., & Paas, F. (2019). Cognitive architecture and instructional design: 20 years later. *Educational Psychology Review*, 31(2), 261-292.

Taleb, N. N. (2012). *Antifragile: Things that gain from disorder*. Random House.

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319-1350.

Teece, D. J. (2018). Business models and dynamic capabilities. *Long Range Planning*, 51(1), 40-49.

Teece, D.J., 2009. *Dynamic capabilities and strategic management: Organizing for innovation and growth*. Oxford University Press.

Teece, D.J., Pisano, G. and Shuen, A., 1997. Dynamic capabilities and strategic management. *Strategic management journal*, *18*(7), pp. 509-533.

The UK Government. (2022). *COVID-19 financial support for businesses*. HM Government.

The UK Government. (2022). *COVID-19 response: Living with COVID-19*. HM Government.

Thomas, J. B., Clark, S. M., & Gioia, D. A. (1993). Strategic sensemaking and organizational performance: Linkages among scanning, interpretation, action, and outcomes. *Academy of Management Journal*, 36(2), 239-270.

Thorgren, S., & Williams, T. A. (2020). Staying alive during an unfolding crisis: How SMEs ward off impending disaster. *Journal of Business Venturing Insights*, 14, e00187.

Thornton, P. H., Ocasio, W., & Lounsbury, M. (2012). *The institutional logics perspective: A new approach to culture, structure, and process*. Oxford University Press.

Thun, J. H., & Hoenig, D. (2011). An empirical analysis of supply chain risk management in the German automotive industry. *International Journal of Production Economics*, 131(1), 242-249.

Tiwari, R., & Herstatt, C. (2012). Frugal innovation: A global networks' perspective. *Die Unternehmung*, 66(4), 245-274.

Turner, B. A. (1976). The organizational and interorganizational development of disasters. *Administrative Science Quarterly*, 21(3), 378-397.

Uhl-Bien, M., & Arena, M. (2018). Leadership for organizational adaptability: A theoretical synthesis and integrative framework. *The Leadership Quarterly*, 29(1), 89-104.

United Nations World Tourism Organisation. (2020). *International tourist numbers could fall 60-80% in 2020*. UNWTO.

Uzzi, B. (1997). Social structure and competition in interfirm networks: The paradox of embeddedness. *Administrative Science Quarterly*, 42(1), 35-67.

Van de Ven, A. H. (2007). *Engaged scholarship: A guide for organizational and social research*. Oxford University Press.

Van de Ven, A. H., & Poole, M. S. (1995). Explaining development and change in organizations. *Academy of Management Review*, 20(3), 510-540.

Van Merriënboer, J. J., & Sweller, J. (2010). Cognitive load theory in health professional education: Design principles and strategies. *Medical Education*, 44(1), 85-93.

Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, 122, 889-901.

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *Journal of Strategic Information Systems*, 28(2), 118-144.

Vogus, T. J., & Sutcliffe, K. M. (2012). Organizational mindfulness and mindful organizing: A reconciliation and path forward. *Academy of Management Learning & Education*, 11(4), 722-735.

Walker, B., Holling, C. S., Carpenter, S. R., & Kinzig, A. (2004). Resilience, adaptability and transformability in social–ecological systems. *Ecology and Society*, 9(2).

Weick, K. E. (1979). *The social psychology of organizing* (2nd ed.). McGraw-Hill.

Weick, K. E. (1988). Enacted sensemaking in crisis situations. *Journal of Management Studies*, 25(4), 305-317.

Weick, K. E. (1993). The collapse of sensemaking in organizations: The Mann Gulch disaster. *Administrative Science Quarterly*, 38(4), 628-652.

Weick, K. E. (1995). *Sensemaking in organizations*. Sage Publications.

Weick, K. E., & Sutcliffe, K. M. (2001). *Managing the unexpected: Resilient performance in an age of uncertainty*. University of Michigan Press.

Weick, K. E., & Sutcliffe, K. M. (2007). *Managing the unexpected: Resilient performance in an age of uncertainty*. John Wiley & Sons.

Weick, K. E., & Sutcliffe, K. M. (2015). *Managing the unexpected: Sustained performance in a complex world*. John Wiley & Sons.

Wenzel, M., Stanske, S., & Lieberman, M. B. (2020). Strategic responses to crisis. *Strategic Management Journal*, 41(7), V7-V18.

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5(2), 171-180.

White, G. F. (1974). *Natural hazards research: Concepts, methods, and policy implications*. In G. F. White (Ed.), *Natural hazards: Local, national, global* (pp. 3-16). Oxford University Press.

Wiklund, J., & Shepherd, D. (2003). Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses. *Strategic Management Journal*, 24(13), 1307-1314.

Wiklund, J., Baker, T., & Shepherd, D. (2010). The age-effect of financial indicators as buffers against the liability of newness. *Journal of Business Venturing*, 25(4), 423-437.

Williams, T. A., Gruber, D. A., Sutcliffe, K. M., Shepherd, D. A., & Zhao, E. Y. (2017). Organizational response to adversity: Fusing crisis management and resilience research streams. *Academy of Management Annals*, 11(2), 733-769.

World Health Organization. (2020). *WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020*. WHO.

Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed.). Sage Publications.

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Sage Publications.

Zahra, S. A., & George, G. (2020). Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review*, 27(2), 185-203.

Zeschky, M., Widenmayer, B., & Gassmann, O. (2011). Frugal innovation in emerging markets. *Research-Technology Management*, 54(4), 38-45.

Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13(3), 339-351.

Appendix list

Appendix one: Participant information sheet

Participant Information Sheet for companies

1. **Name of department:** Hunter Centre for Entrepreneurship
2. **Title of the study:** SME decision making process during periods of significant exogenous crisis

Introduction

The researcher conducting this study, Daria Samatoina, is a PhD student at the Hunter Centre for Entrepreneurship, University of Strathclyde.

What is the purpose of this research?

The purpose of this research is to investigate the intricate interplay between crisis, uncertainty, and organisational decision and sense-making, along with learning within the realm of Small and Medium-sized Enterprises (SMEs) situated amidst the unprecedented backdrop of the Covid-19 pandemic. This study aims to shed light on the dynamic process of SMEs' learning as it unfolds in the midst of extreme uncertainty. By employing a longitudinal data collection approach, a major objective of the study is to gain nuanced understanding of how SMEs navigate the tumultuous landscape of the Covid-19 crisis while gleaning lessons from the evolving crisis context. This study further aims to go beyond standard evaluation methods, which typically rely heavily on 'after the fact' assessments of hard performance data. The findings are likely to elucidate that heightened crisis impact and uncertainty serve as catalysts propelling SMEs towards a range of sense-making strategies.

Do you have to take part?

Your participation in this research is completely voluntary and you may refuse to participate or withdraw from the study at any time, up to the point of completion, without having to give a reason and without any consequences. Anonymised data (i.e. data that do not identify me personally) cannot be withdrawn once they have been included in the study.

What will you do in the project?

Initially, you will take part in a semi-structured interview lasting between 60 to 120 minutes. The location and dates of the interview should be proposed by the participant depending on their availability and preferences. The researcher will ask your permission to take an audio recording of the interview. Following this, participating firms would be required to complete online diaries to record key development events as well as associated commentary on those events. Similar reflections and observations will simultaneously be recorded by associated account managers. The total period for the diary collection portion will be 12-15 months. The

expectation is that this would involve at least one entry every month, although you will be free to participate in the process as and when you wish. Following the end of the diary collection period, a final exit interview will be conducted. You might also be asked for certain information on an ad hoc basis; for example, responses to specific questions by email or phone call.

Why have you been invited to take part?

You have been invited to participate in the research either because you work at the Highland and Island Enterprise or are a senior figure (i.e. founder or MD) of a growth-orientated firm that receives/received support from Highland and Island Enterprise.

What information is being collected in the project?

The data collection approach will primarily drive at uncovering the following forms of information:

1) First-hand reflections on challenges, including how these are identified, communicated, and shaped into actionable strategies to sustain during the crisis
2) First-hand reflections on the process of strategical shaping during the Covid-19 crisis
3) Reflections on organisational learning

Who will have access to the information?

In its unedited format, the data will only be accessible by the two investigating researchers. Any subsequent outputs based on the data will be anonymised and participant's disclosed information will be kept confidential. This includes all names and places, as well as company specific information (e.g. products, services, markets, partnerships). The researchers are open to signing any further company-specific Non-Disclosure Agreements, if individual firms deem this to be necessary. Data access is subject to the University of Strathclyde's research ethics policies and procedures.

Where will the information be stored and how long will it be kept for?

The unedited data will be held on the University of Strathclyde's secure servers, or on the StrathCloud system. All digitally recorded data will be stored on password protected devices and all written material (hard copies and notes) will be stored in a locked office with access available only to the researcher and supervisory team. Anonymised research data will be stored in a suitable data repository for as long as it is required for research needs and destroyed in line with the university's data management policies.

What happens next?

The researcher (Daria Samatoina) will contact you to arrange an initial meeting. From there, further correspondence will be conducted as appropriate.

Researchers' contact details:

Daria Samatoina - University of Strathclyde

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199 Cathedral Street
Glasgow,
G4 0QU
daria.samatoina@strath.ac.uk

Chief Investigator details:

Dr Russell Matthews

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Hunter Centre for Entrepreneurship
Duncan Wing, Level 8, Room 8.19
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This research was granted ethical approval by the Hunter Centre for Entrepreneurship Departmental Ethics Committee on behalf of the University of Strathclyde Ethics Committee.

If you have any questions/concerns, during or after the research, or wish to contact an independent person to whom any questions may be directed or further information may be sought from, please contact:

Secretary to the University Ethics Committee
Research & Knowledge Exchange Services
University of Strathclyde
Graham Hills Building
50 George Street
Glasgow
G1 1QE
Telephone: 0141 548 3707
Email: ethics@strath.ac.uk

Appendix two: Consent form for companies

Consent Form for companies

Name of department: Hunter Centre for Entrepreneurship
Title of the study: SME decision making process during periods of significant exogenous crisis

- I confirm that I have read and understood the Participant Information Sheet for the above project and the researcher has answered any queries to my satisfaction.
- I confirm that I have read and understood the Privacy Notice for Participants in Research Projects and understand how my personal information will be used and what will happen to it (i.e. how it will be stored and for how long).
- I understand that my participation is voluntary and that I am free to withdraw from the project at any time, up to the point of completion, without having to give a reason and without any consequences.
- I understand that I can request the withdrawal from the study of some personal information and that whenever possible researchers will comply with my request. This includes the following personal data:
    - audio recordings of interviews that identify me;
    - my personal information from transcripts.
- I understand that anonymised data (i.e. data that do not identify me personally) cannot be withdrawn once they have been included in the study.
- I understand that any information recorded in the research will remain confidential and no information that identifies me will be made publicly available.
- I consent to being a participant in the project.
- I consent to being audio recorded as part of the project

(PRINT NAME)	
Signature of Participant:	Date:

Appendix three: Interview protocol (pre-Covid-19 crisis/introductory interview)

A. Current status

1a. Background of founder and firm

1. Founding story - why did you start the company? What led to the opportunity?
2. Founder background and experience

1b. Overview of the firm's business model as it stands currently

3. Main products/offerings
4. Key market segments
5. Core activities/operations (e.g. what is done in-house, what is outsourced, etc)
6. Competitive landscape (main competitors

B. Current growth plans

2a. Do you currently have a specific strategy (or set of strategies) to grow the firm?

Based on? For example:

1. Volume growth of existing segments and markets?
2. Capturing new segments (e.g. new geographical markets, high value clients)?
3. Improving internal efficiencies e.g. cost reduction of operations or process innovation
4. New product/offering development
5. Change in business model

2b. What are the main challenges associated with this growth strategy?

(i.e. what do you have to do in order to carry out your strategy?)

6. Operational aspects
7. Lack of knowledge
8. Human resources
9. Entry barriers (entrenched competition, market entry barriers)

2c. How do you develop strategy?

10. Who is involved in the process of deciding major strategic decisions? Can you describe how this process works?
11. Do you ever formulate your top-level strategies in conjunction with support services (e.g account managers)?

1. Historical growth events / trigger points

Can you identify specific historical periods of growth (or change) experienced by the firm?

Start with the early stages of the firm and see if you can describe notable periods of change (periods of significant investment, growth in revenue/employees, changes to core markets, changes to core operations, etc)

1. Can you comment on any major success stories in your firm's development (during the period that you have been supported by HIE)?
2. Can you comment on any major challenges in your firm's development (during the period that you have been supported by HIE)?
3. What involvement / role did HIE have during these major growth periods?

For this section we would be best developing a basic timeline for each firm using historical information (e.g. google searches, press releases, etc).

2. Engagement with support services

Initial engagement with HIE

1. How long have you been receiving help from an account manager and HIE?
2. When was the first time you found out about the help available through HIE?
3. What stage was you at when they first began engaging with the account management team?
4. Why did you seek support from HIE?
5. Why do you think you were qualified to receive support?
6. What were your initial meetings with HIE like? What was the focus of these meetings?

General overview of support:

7. How do you typically find out about different support interventions available in HIE?
8. How many interactions would you have with him/her in an average month (or year)?
9. Can you describe the typical interactions that you would have with support services (meetings, workshops, emails, etc)?
10. Can you describe the content/objectives of a typical meeting with an account manager? How do express your support priorities?
11. Over the total period that you have been receiving an account manager support, has the way you are support changed significantly?

Triggers for / framing of support needs:

12. What typically triggers you to engage with an account manager?
13. How do you identify specific challenges that you require support with?
14. Can you describe the process for translating the firm's/your needs into actionable forms of support?
15. What is the most challenging aspect of trying to get effective support from HIE?

Effective/positive experiences:

1. From your personal experience, can you give examples of support efforts that have been particularly effective? What do you think made these interventions successful?
2. Do you have an opinion on what constitutes 'best practice' for supporting firm growth? Can you comment on where this opinion comes from?

Ineffective/negative experiences

3. Can you give examples of support efforts that have been particularly ineffective? What do you think made these cases unsuccessful?
4. What do you think are the greatest barriers that firms face when trying to utilise or implement the various forms of support that they are given?

5. What do you think are the greatest weaknesses/drawbacks/challenges associated with engaging with support services?

Future engagement

1. Can you comment on what you see can be the future strategic barriers for your firm? What do you see being your major challenges and opportunities?
2. What support needs (if any) do you think you will require to address these challenges and opportunities?
3. How do you see your relationship with HIE (and related support services) developing in the future?

Appendix four: Interview protocol (longitudinal/during the Covid-19 crisis)

Monthly longitudinal questions: *

Companies:

1. Tell me briefly what has happened in the last month?
2. What are the problems you are currently facing because of the Covid-19 crisis?
3. How ready were you for a crisis like that?
4. What do you think will be the potential impact of the crisis on your business (now/within a year/ in 5 years)?
5. Would it change the way you do the business (now/within a year/ in 5 years)?
6. What did you learn from the crisis so far, related to your business?
7. How can you be more ready for something like this in the future and can you?
8. What impact did the virus have on you as a person, which can influence your entrepreneurial approach and activities?
9. Would the crisis make you more resilient? And if so, how?
10. What would you change in the way you conduct your business as an entrepreneur because of the virus (practical acts)?
11. what would you change in your approach, as a result of Covid-19?
12. What would you suggest for future entrepreneurs based on your reflection on the crisis (the way to do business and key skills needed)?
13. How do you formulate your problems now as a result of this crisis?

Other potential questions (semi-structured interview)

1. Any growth-related changes within your business?
2. What about your growth plans?
3. As a result of this crisis and everything that is happening now. How would you formulate your problems now?
4. So would you say the strategies that we've talked before are they still in place or they've changed?
5. Any Covid-19 related support?
6. And what was the biggest lesson that you've learned because of the COVID crisis? And did any of your perspectives change in the last 10-12 months?
7. And what was the biggest lesson that you've learned because of the COVID crisis? And did any of your perspectives change in the last 10-12 months?

*Note: questions may vary depending on the venture and environmental circumstances

Appendix five: Transcript sample for High-Growth Enterprise four (HGE-4)

March 2020 ****Beginning of the lockdown measures****
"Interviewer: What is the most recent update between you and your account manager or HIE? Interviewee: I had a meeting with my account manager a few days before everything got shut down, where I discussed the help I need with digital marketing. Previously, I had a person from the industry coming in and helping me to understand what I have to do and provide me with a bit of advice regarding digital marketing. Hence, our last meeting was around this. So, after that, there was a lockdown initiated and everything sort of slowed down. After that, my account manager sent few emails with general updates and links for digital loans. Everyone is currently dealing with the situation, so there has not been much contact and to be fair, it has only been a week. Interviewer: What are the key changes within your business or how was it influences? Interviewee: In terms of my business, it has been quite challenging to adjust and work from home, while kids are around, but my work has been moving positively, and I am trying to use as much of this time working on digital development.

Interviewer: What are your future plans?

Interviewee: In terms of my strategy and any growth plans, they are definitely being put on hold, mainly because my target market was luxury hotels, but now they are struggling, and this is not the best time for them. So, right now, I am focusing on things I did not get a chance to do before. I am quite positive, but it is also scary as things are changing every day.

Interviewer: How do you think this will influence your business?

Interviewee: After we come out of this, my growth trajectories are going to be very different, but I believe there are opportunities present as well.

Interviewer: What is HIE doing right now and how are they supporting you?

Interviewee: HIE's reaction is quite slow in providing the information, but this is probably because there are biggest clients with more immediate priorities than me. So, I have not been provided with my actual reassurance so far".

April 2020

"Interviewer: Just a few additional questions because, obviously, a lot has changed and last month or even two months ago.

Interviewee: Absolutely.

Interviewer: So probably the first question is just the average, the usual one, is what happened in the last sort of three four weeks with your account manager and what communication did you have or did discuss if you had any?

Interviewee: Yes, so what I would say is I have been somewhat surprised that I have not heard from him directly. Today I have had emails that are advising of forms and information, but nothing that is personal or direct to me. So I think that is, obviously, he is busy signposting information that HIE putting out or other discussion government support agencies are giving out. So those are the things I have had. I have emailed him about a couple of things that he has replied. But I just thought I might have had him reach out to me and say, "How are things going?" or "How does it impact your plans?" "What are you doing?". Something more proactive than just sending me the information sheet that is coming out through these agencies.

Interviewer: He mentioned that you are looking into applying for funding or a loan. I think it is twenty-five thousand that he mentioned.

Interviewee: Right, okay. That was the loan depending on what he is referring to. There is a Hardship Fund.

Interviewer: Yeah, I think it is the Hardship one, yeah.

Interviewee: It is the Hardship Fund, okay. Yes. So, I have applied for that but he did not get involved in any. He has not spoken to me directly about it. I have applied for that effectively anyway because I was aware of it, but he probably signposted. That is probably one of the things he signposted. But I was sort of aware of it coming just before his message came through anyway through another link. Yeah, so I have applied for that. I am just thinking, I mean, I am working on plans to pivot and not messy change direction but just take us different route. So go about a different route and that is what I am working on myself. But I have not had any interaction with him about that.

Interviewer: Are you talking about the different route in your business or in the relationship with HIE?

Interviewee: No, with the business. It will be a different route because my target audience has now, because I am in hospitality that has obviously, totally gone for the next year I would say. So, I am now looking at a more digital presence and building that

and have actually invested in some for that myself to make that happen.

Interviewer: Did you ask account manager or HIE for support in that sort of new way of going?

Interviewee: No. I did have the meeting with him which I reported on the last time we spoke which must have been about six weeks. That was actually the end of March, was not it when we spoke last? And I think I have just seen S** (*the account manager*) and St**(*different account manager within HIE*), then. And they had come and it was really to just talk with St** (*different account manager within HIE*) about the digital aspect. So really, part of what I have done is taking above what he just said, what St** (*different account manager within HIE*) said, and the recommendations he made. And I have actually gone out and saw my own consultant effectively to help with that.

Interviewer: Was there a reason why you did not ask them for a consultant? Why did you decide to go on your own?

Interviewee: I wanted to move quickly and to be understand there, I just did not think and I probably should have just done that. I just wanted to do it this way because it felt like the right thing for me to do at this point. But I will follow up with S**(*the account manager*) and arrange a time to talk to him.

Interviewer: Before crisis and during the crisis, does it make much difference having an account manager for you?

Interviewee: I think it would do but it is just a difficult thing about what you consume, about what you do want to be repeated is literally back. He is not necessarily my first port of call. And he is not necessarily the first one he should be. In reality, he should be the first person I think of to call. I tend to think to call him if there is something specific he has referred to that I think he can help with. But I tend to reach out more broadly within my own network if there are things that I think I might get help. But actually I should probably go to him anyway with it. And that is why I think if he was calling me to find out where I am at, because he knows I have got a high loan. And a plan was going desperate. If he is thinking about where I am at, I would have expected some sort of email. Do you want to chat? Considered that we can help with but there has been nothing at all. So, yeah.

Interviewer: And I know that obviously, HIE, providing help is for free, essentially. Sometimes they ask for something in return, like attending and speaking on their behalf or doing some projects with them. So essentially, the question is, what are you giving back to HIE? How does the relationship work?

Interviewee: They have not asked me to do anything yet. I am in a portion doing some surveys. There is a couple of things but there has been nothing least that they have asked me to do specifically.

Interviewer: I know that HIE is collecting data from their companies and how they are dealing with the crisis. And they usually would call clients and just ask them just a few questions. Did they do that with you or no?

Interviewee: No, I have not heard anything like that. I do not believe unless it is committed as an email that I have missed. I do not think I have had anything. That is why I am surprised. I feel like I have gone all through with a little bit. I did email him about something and asked him about something. Again, I did tell him that my IP filing is looking a ninety percent. We have got it which is great. And he replied back and said, "Great. That is good. Looking forward to hearing more work". But no commitment to when or just looking forward to hearing the progress. It just feels like it is a taking over exercise rumbled up. There was no reaching out which I am just a bit surprised at this point with the crisis. My own plans are totally gone that he has not connected. And neither have I gone to him, which, yeah.

Interviewer: Well. One of you probably should, I think.

Interviewee: Exactly. I know what I will do. I will see him. Yeah, I know I did. I am just thinking actually, let me just see because I did ask him. There was something I did email him about. I think actually what happened was, I think I might have called him and left a message for him to call me back. And I am just trying to remember what was that about. Oh yes, that was back on the 30th. Let me see. It is all information about webinar, webcasts he has forwarded to me. I think it was probably had to do with when the announcement was being made about the Scottish government additional funding which covers creative industries, which is where I am and could be good if I could get. So then I sent him an email on the 30th while I was filling out the application, "Good to hear from you, and here is this fund. It would be good if you could give me a call when you are free. Any time is good as I am working at my desk. I am applying for the fund. Do you know if there is a problem with it? Okay, so, he has come back with, 'Thanks! I am sorry I missed your call. I was on online meeting. Unfortunately, there are which means people are not able to select the Yes button. Fixing the Yes button is a matter of urgency. Let me know how you get on". And that was it. But that was specifically because I went to him about the application. Because it was an issue online. That was last week. What else? He sent me a note information about loan.

Interviewer: Had there been any anticipated support outcomes that did not sort of happen, not even regarding the crisis and anything, but just an overall sort of anticipated outcomes from certain support?

Interviewee: No, I mean, there was nothing astounding, there was not anything I was expecting. The whole thing from our last meeting, it was a word for me to action. The reality was the last meeting was very much looking at the digital, on upgrading my digital promotion effectively. And at that point certainly, I was going to have to invest money to get the website upgraded, optimized better, if that makes sense. And at no point was there any offer or suggestion, or that there might be some funding or support. So that is probably why I had go on and done this myself. Because effectively, I need to just get it going. Actually what we have talked about in March. That was action at the end of March when we had that last meeting. And I would say there has been no necessarily follow-up from him other than just forwarding information about whoever knows our information or funds that are obviously ones that have gone out to a number of people, I would think.

Interviewer: And how do you measure the outcomes of their support? Or even if you measure outcomes of their support?

Interviewee: In different points of time, it has been different because it depends where it have been asking for. I mean effectively, if I emailed him now and said we need to talk, I need to talk through something, he would respond to that, I would expect. He would arrange a meeting of some sort. And depending on what I am asking for, that could lead to suggestions or additional help. So certainly, he has always offered help when I have asked for it if they can help, if I know what I am asking for. But I guess what I am not getting perhaps is the challenging account manager who could be saying, "Have you thought of this? What are you doing about that?" It is very much coming from me to him rather him to me, if that makes sense.

Interviewer: And whenever you get some sort of form of support and then you have implemented it in your business or used it, would you have measured the outcomes from whatever you have implemented or used from them?

Interviewee: I just get on with it. I mean, if it matters what I expected which then great. If it did not, I would probably go back and say, "That is not or it is not working". Or I would probably give a feedback if it was not working. But if it is what I have expected, then I would just carry on.

Interviewer: Was there ever a situation where you went back and said that, "I do not think this works for me. Can we think of something else? Or can we change it or something around that?"

Interviewee: Not that I can think of the minute. Possibly. Going way back to the last year when we were into various option and looking at grand funding potentially and more loans. We probably went back and forth a bit on that, but not recently. We have not. I think possibly because a lot of folks who's getting a loan to keep the business going in the right direction rather. That was the biggest one recently. But since then, he is quite hands off. He will react when I call him, but I am not necessarily getting a lot

coming from him, asking how things are going.

Interviewer: Did you ever have to negotiate any stream of support that you would like to have in terms of the process? Or is it usually, you asked, and they sort of find a way to give it to you whichever way you wanted?

Interviewee: Yeah. I think we have been able to get most of it. In reality, I have been very happy with help that HIE had given me. Mostly, that has been in limited terms in support for different aspects like, if it is fifty percent funded, then that is great to have something rather than nothing. And also on the consultancy support, when I have asked for consultancy in different areas that has been forth coming, I would say.

Interviewer: And how would you formulate your problems now as a result of this crisis? And how do you sort of report back to HIE?

Interviewee: That is a bit that is missing. I think it because HIE have not reached out to me to find out what the problems I am having.

Interviewer: And isolating from them, would you formulate your problems now differently because of the crisis? Or you sort of pretty much the same as before? If you take out HIE from this perspective, as a person on its own, would you formulate your problems still as you were before or you sort of changed your perspective towards the business and the problems you are having and how to tackle them?

Interviewee: Well, I think I am driving the decision making anyway. So irrelevant of HIE, I am still go through that same process and making the same decisions because they are not necessarily impacting on me at this point in time. But I will certainly, before the next call, make sure I have a call with S**(*the account manager*) just to go through where I am at and see what he has that he can offer to support that.

Interviewer: So, before the crisis and before the virus, it so pretty much stay the same. So you would just carry on with your business and then your problems are coming your way?

Interviewee: No. I mean, certainly, the orders that drop off and the events that I had planned to do this strategy for the next six months has effectively been torn out because all the events which were at least one or two month that I had planned to be at and in some cases for have now been cancelled. And that is now on hold. So, my business is very much up in the air as to where I will be selling, and I am sitting with a lot of stock. It is not a good place spot.

Interviewer: So, do you think when you will be calling next S**(*the account manager*) you would tell him all of these problems?

Interviewee: Absolutely. I will actually have to at least drop an email or a call with him and say, "Look, we need to talk". So, he is up to date."

May 2020

"Interviewee: I was looking for additional help with IP because well actually just who I was looking for additional help on a particular subject which I wanted to engage with one of the other HIE advisors and I did eventually get a reply service 24 hours later because I've actually marked as urgent really need to speak to him. And anyway, eventually he wrote and said, he was quite busy and I should go direct which is what I did and I got an immediate response and from the HIE advisor that I needed and straight away she was able to put me in touch with the person that I needed to which is what I was trying to do. So that's the only contact of her, I haven't spoken to my account manager. He emailed that he's - they're busy looking out the grant funding the hardship on so that's what they're all working on.

Interviewer: And in terms of any updates regarding the crisis and everything, he still forwarding information. Did he offer you any sort of to go to any funding opportunity or something that you can benefit from?

Interviewee: Yeah, the funding, they came out, creativity, hardship fund which came out. I think that's probably was over a month ago, or I don't know if that him. I mean I spoke but certainly, he would have sent me the email around that and that's what I've actioned, but I'm still waiting to hear if I am getting it or not? So yeah, there were probably was a reference there, to that fund.

Interviewer: And then terms of challenges that happened in your business in the last three weeks, has there been any new challenges?

Interviewee: I think advance is really looking to the future and putting plans, place, and developing the website, the digital content to be more customer focused and more optimized which is what I'm currently working on.

Interviewer: And how is in terms of your business now, what's happening in there?

Interviewee: It's still static at the minute and we are now trying to do more offers and more engagement with consumers to get direct sales. So I've actually engaged with a number of specialists who are helping me with that and I've done that, I had with him,.

Interviewer: So they help you to find some specialists too?

Interviewee: No they didn't, I find them myself.

Interviewer: Oh, so you did them yourself?

Interviewer: And, yeah, so the help that they provided you was online sales before and they have to not be previously, yes. I think a couple of months ago, I had - they did help me with giving me some advice. I guess following that advice, I'm actioning some of that advice but I've done it myself directly, with - I find that the I've sourced the people myself to work with.

Interviewer: Okay, that's fine. And in terms of sort of the future plans on how to come out of all of this, would you potentially need any help from HIE or advice.

Interviewee: Yeah, I mean, there's likely to be more and certainly moving on the innovation front from where I've started. And we're looking at that - looking at that as an opportunity as well. I am just a bit of a slog at the middle of trying to focus on the future, make the appropriate changes on the website, and effectively making decisions as well. But without knowing when - without those additional funding that absolute to find out about that's the hardship of Scottish government hardship fund that will also help with what I'm trying to push forward. As well as just in general, trying to get consumers interested in the product."

June 2020

"Interviewer: What has happened in the last three, four weeks? When did you contact your account manager? What did you talk to him about? Any new updates on support provision from them?

Interviewee: Yeah. Certainly I have not had contact with S**(*the account manager*). He has not contacted me, I have not contacted him. And that is, probably I would say maybe, I think the last time we spoke there was not any contact either. What I have had, I did get one of the hardship grants to help with the business, which S**(*the account manager*) was not involved in, but it obviously came through Scottish enterprise, rather than HIE. So I did not actually speak to him about that, but I guess I assume he may be made aware that I got something. I do not know, because I have not had contact from him. There has been a couple of emails, just general ones about provisions of what HIE is offering in terms of training costs, webinars, I guess.

Information sessions, links too. So I have had a couple of those. But I have got to say, it has been very fun, very fun situation. So I have not reached out to him either, I am just getting on with what I am doing because I have brought in people to work with me which I have sourced myself.

Interviewer: Do you know what is the reason that you have not spoken to each other for the past couple of months?

Interviewee: No, not really. He has not reached out. When I did reach out to meet, he just said he was busy with applications for the funding because obviously HIE, at one point, were involved in search of some of the funding. But no, I do not know why he has not contacted me. I have had no direct reason really to contact him because I am just getting on with it myself. So yeah, there is a bit of a stalemate there. There is no reason, I said. We have not had any falling out or anything like that. We just literally have not spoken.

Interviewer: Yeah.

Interviewee: So I will put that on my list to have a catch-up with him. Before we talk next time. So is there something more to talk about?

Interviewer: Yeah, and those webinars that they are offering now, are they helpful in any way? What is the information that they provide?

Interviewee: I guess I am connected to a lot of support groups through my network. Also, an awful lot of free online stuff at the minute. So most of my support is through things I am accessing myself through existing contacts or through, yeah, it would be existing groups but nothing has directly come through from HIE that has been specifically. A lot of the funding options and support has come through Central Scottish Enterprise. But I am not aware of specific things that are coming from HIE.

Interviewer: Yeah and when on normal circumstances like throughout your relationship with your account manager, how do you frame your support requests? So would it be you coming in saying I need help with this, or it would be him saying I think you need help with this aspect in your business, or it is a mutual decision? So how is it usually?

Interviewee: It has always been me asking for it. I mean I do get forwarded information that might be relevant, but I think it has probably taken into account what he knows, where I am at. But generally those are things that are happening within HIE that he then chose to send me. But no, generally when I ask for a meeting it is because I have asked for it rather than he has.

Interviewer: Yeah and is it hard to access resources from HIE in general? So the process of putting up applications and getting support, is it hard in your opinion?

Interviewee: I know I think I have been very specific of what I have asked for and in general if I have not got, I have been able to get to the next stage of talking to somebody else about it or getting feedback as to why we did not get it. So I would say no, for me it has been fine.

Interviewer: Once you have gotten the help and you have sort of used whatever help they offered you, do they come back to you to ask about the feedback? Was it good for you? Was it beneficial?

Interviewee: No, actually. That is interesting. I do not think I have had any feedback requests. Nobody has ever said. There has not been, not that I could think of and I may be missing it. But certainly on the direct stuff, I have not had any questionnaires to fill in that relate to that.

Interviewer: And if you, for example, are looking for some sort of support stream and you have put an application but that has not been granted, would your account manager then redirect your requests? Would he look for an alternative to propose to

you?

Interviewee: I think I have said that for me, I have effectively got what I have asked for but what I have asked for has often come from a conversation with him, just let me know what is available, if that makes sense. I have been signposted to something directly and this is going back, this is not recently. For example, the innovation fund, support around the IP. We have now had confirmation that I am virtually ninety percent there of having it. I do not know if we had that in the last call. But basically my IP lawyer has said the IP office have accepted our application and they are now processing that. So in this situation it is unlikely, unless somebody comes forward and says that they invested this first, then it should come to me. So that has been great. What I guess, what I would say is the funding I have accessed or the support, well not necessarily funding, the support and funding has always come on the back of a conversation with S**(*the account manager*) in the past because I do not necessarily know what is the offer but I need to go through him. So he generally suggests whether there is this or that. Sometimes it could be, you know, a contact with interface, it could be talking to somebody to get advice. But I have never got to a point where I have been refused something because that has been part of the conversation to start with. But I do not necessarily know what is available unless I have the conversation and then it is offered to me.
So right now, I guess what I, and this is another reason why I need to contact S**(*the account manager*), there may be other support or help out there that I am not aware of that he has not had that conversation with me about and I do not know to apply for."

July 2020

No contact with a company representative

August 2020

"Interviewer: Last month, you told me that you had a meeting with Scott. We were supposed to have a meeting but then no one got back to each other.

Interviewee: I had a telephone call with S**(*the account manager*). Obviously, we are not meeting. I talked through with him where I am at and most of planning and he was very supportive. There was a couple of things that came from that regarding getting some more potential advice which it is sort of leading and this was around areas that I may needed extra support on which he was helpful about. So yes, that was all very positive.

Interviewer: So what exactly did he offer? So what resources, did you ask for?

Interviewee: Well, I was looking at more innovation. We were also looking at other two things. One is digital support to overview the work that has been done because I have been working with an independent digital guy and it was useful. I asked, could he just have a look at what has been done today and just give us an overview of what he think it is a positive, which he did, came back on. And S**(*the account manager*) came back with feedback areas and that was very useful. We also talked about a couple of areas of product development that I am working on at the minute. And there is still more information to gather but he said he would reuse that with the innovation team because it is another area of innovation.

Interviewer: So is it more of an intangible resources like advice, knowledge, etc?

Interviewee: It would be looking at potentially what additional support they could get with this next level of innovation that we are looking at. So that would be bringing in the innovation team.

Interviewer: Okay, so they would consult/ advice you?

Interviewee: Yes. So they would look and see how they could help and support that.

Interviewer: And are you looking to get any financial resources from them?

Interviewee: Potentially, but we have not got that far yet. We are just making them aware at this point of what we are looking at doing.

Interviewer: I think S*** mentioned that you got innovation grant or there was some funding available as well.

Interviewee: I got the hardship grant which is not innovation fund. It is just everybody applied for different things through COVID-19. That is what I got a grant which was basically to help me bridge the next number of months while there was little sales coming in because of what was happening and actually, sales have just gone crazy. This last week, as of September, everybody is woken up to the fact that it is cold and the need to more duvet and pillows. So that has been really good for my business.

Interviewer: Yeah. Did they offer any support in getting that grant or it was just you on your own?

Interviewee: No, it was me on my own on that one.

Interviewer: Okay. Are you planning to talk to him anytime soon?

Interviewee: I probably will do in the next couple of weeks. So I expect we will have another call before you call in a month's time.

Interviewer: Okay. So are you planning to ask for any additional resources from them or sort of you just going to get on with this sort of knowledge and advice, resources?

Interviewer: And, certainly I will carry on. I need more stuff to gather together before I can pass that request back to HIE and more research I need to do so. Yeah, that is all happening. ”

September 2020

No contact with a company representative

October 2020 & November 2020

“Interviewer: did you receive a grant?

Interviewee: Yes.

Interviewer: So he postponed you to that?

Interviewee: Yes, so he did. That was the digital grand which really has a well-transformed business at this point. Because of things that I have been able to put a lot more effort into the digital front because you cannot go and see people or the hospitality industry which is our key mark. It is obviously I’m an awful state. So, we have had to shift pretty quickly and focus more on consumers. That just means that our website has more of a consumer folding and we are doing a lot of work on the back end of it. I got a really good guy brought in to help us which has been brilliant. Which is what the grant stand for. So, it is all very positive at the minute.

Interviewer: So did you expect this resource or it just happen to appear and you are glad that it happened?

Interviewee: Oh, perfect timing! I was not expecting this resource at all and I have seen the light to get it as well. Because any help at the minute is great, everybody is in such a difficult situation. Money is being spent online but there is a lot of competition right there so it is trying to be a part of that. Our website was basic but it needed more content engagement and more optimization, which is what we have done. In a week virtually, from guessing the go-ahead last Friday. That the money

that we have gotten, I was planning to do a bit over a much longer time. It would have taken a lot longer. It meant that we were able to just - to everything else and within a week we have jumped late because I had everybody setup to go and we cannot do massively. So really pleased with what is going on. And the next couple of months was hell, hideout, no works and a lot of engagement is with the target customers right there.

Interviewee: Was there any other resource that you have asked your account manager for apart from getting this grant?

Interviewee: No.

Interviewer: Or anything that is offered, given the fact that he is aware about the problem with your website? And do they want to improve it?

Interviewee: I am just trying to think in terms of the last conversation I had with him. Not really because in reality. Some of that spend expenditure had shifted. However, it just means that it is a grant that has eased the stress of the expenditure issue. Because it was getting further into debt without the sales coming through and I knew we needed to throw money, which was all I cared for all of the things into the website. Getting the grant means we are in a better place now to be able to spend the loan money that we have.

Interviewer: How many times have you talked to him in the last month or a month and a half?

Interviewee: I just think I have not spoken to him at all in the last month and I think the last was probably two months ago, maybe six weeks ago possibly. Certainly, we have not held a conversation all the time that he emailed me about the grant. He did email me to say that the deadline had been brought. The deadline was because that came forward from what originally thought. He did keep me posted. Although there has not been any further communication.

Interviewer: Is it because you do not need any resources from them or you are just busy with your own stuff?

Interviewee: Yes, I am busy with my own stuff. I know certainly if I went to S**(*the account manager*), he would be available for me to talk to, but no, there is nothing that I have needed to go to him for. Once I knew that this grant was being presented. I think, as it has always been, he is there when I need him if I ask a question. He forwards information to me things that he thinks are relevant, I guess as they come in. But there is not necessarily a regular-- certainly over the last couple of months, a regular catch up for example. We do not have a regular catch up to see where things are at. I guess I would imagine something that they would be doing, but I do not know if it is based on different levels of customers in demand; what his workload is. I have seen a lot more to deal with since this happen.

Interviewer: Well I think they are just generally quite busy now. But I think there are more clients approaching. More reacting approach, rather than proactive.

Interviewee: Right, so the clients raise the issue and then they work from there. But certainly, St**(*different account manager within HIE*) was very helpful too because St** (*different account manager within HIE*) was covering for S**(*the account manager*) while he was away for a week or so on a holiday whatsoever. So St** (*different account manager within HIE*) was asking some questions and he was able to answer them very quickly. We also got the website up. I am going to drop him an email today saying, "Thank you very much for your help." Looking at it now, you can see the difference from where we were ten days ago.

Interviewer: Do you think that St** (*different account manager within HIE*) gives you more insights in like intangible resources compared to S**(*the account manager*)

Interviewee: I do not know how to put this in writing but unofficially yes. It depends on how you present that back. I think St**

(*different account manager within HIE*) comes from the digital world and so he is much more engaged on that front and he has much more experience. He is probably more connected to what those needs are. For S** (*the account manager*), he will help when I need to. It is just they are two different characters. I would say one is certainly more dynamic than the other. It is different personalities I guess."

February/ March 2021

Interviewer: What happened in between now and the last time we spoke? So probably in the last couple of months?

Interviewee: Okay. Let me think. What has happened? I think when I last spoke to you, I am not sure, I had received the digital grant which I HIE gave me and that has been fantastic. The digital grant has helped me to be able to bring in some expertise to work on the website, and that has resulted in increased sales.

Interviewer: And how did you come across that grant? Did your account manager suggested it?

Interviewee: S** (*the account manager*) had forwarded me the link to it. Yes, he did alert me to the funding available. I also read it in the local promotion, but my account manager did alert me to it.

Interviewer: Was it easy to get it?

Interviewee: There was obviously a form to fill in and there was a timeframe to get it in by, but they were fairly quick at getting it back so that was really good.

Interviewer: Was it internal HIE's funding or it is external?

Interviewee: I think it is government funding but I am not sure if it was just been given by HIE within the region. Maybe it was just regional, I do not know actually, but it was certainly being administered by HIE. That makes me think it was just HIE rather than Scottish Enterprise.

Interviewer: If you would be reflecting back to the twelve months that we have been talking, what are the major benefits or advantages that HIE provided you with? Any particular support that had been offered that benefited or changed the way you managed your company?

Interviewee: I would say that in this case my account managed has been incredibly quiet through all this turmoil because I assume he has been busy. But, certainly, if I have reached out to him and asked for something, he has come back to me. But we have only had, in a year—I do not even know if we have had a conversation—maybe one. So I have messaged him by email, but they have certainly been supportive in getting this grant funding which has really made a difference.

Interviewer: Why do you think it has been quiet? Do you think it is because of COVID workload or because they were busy?

Interviewee: I do not know. I really do not know why or whether he thinks I do not need support. I do not know. I really do not have an answer. I know certainly he has been busy with administering the grant funding that has been given out on a number of different levels so I would say that is a part of it.

Interviewer: Given the fact how everything has changed in the last few months, what is the most challenging aspect of trying to get effective support from HIE?

Interviewee: Well, if the digital grant funding had not come through when it did, I probably would have been asking for something like that. But as that was offered at the right time, it was perfect. It was absolutely perfect for what we were doing with the business because everything was going online, and we needed to have a stronger presence. So, everything has worked

out for us by having that grant funding in place at that point in time. It is a lot. Yeah. It is difficult to answer. Otherwise, if that had not been there, we would be in a different situation right now.

Interviewer: Given the fact how everything has changed, over the last ten or twelve months, what is the most challenging aspect of trying to get effective support from HIE?

Interviewee: The most challenging thing is actually... I guess when I have asked for support, I get a response. I would say I did get a response. It may not be particularly quick, but I did get a response. Yeah, but we do not have regular catch-ups as such. He does not call me to see how things are going or ask. It is me going to them and them responding rather than them coming to me. Although he does send me information about stuff and about grants when they come up, so I am probably included in communication, I would say, if something comes up that might be relevant.

Interviewer: Since we left the EU, what are the main challenges that your business has been experiencing or expecting that you would experience?

Interviewee: Oh my goodness. Yes. From a manufacturing point of view, so far it has been fine. But from an export point of view, I have had to put a hold on shipping to Europe because we were not actively targeting Europe but I am holding off the next four months on that because there are so much bureaucracy and so much difficulty with shipping into the different countries that, for now, I am just going to hold off until that settles down, until the paperwork is sorted. It has basically put back our expansion into Europe I would say.

Interviewer: Is HIE providing any support in helping with this? Did he address these issues that you were having to them?

Interviewee: No, it is just a strategic plan. I have not already started shipping to Europe. I was planning to look at that this year but all the plans for this year had to change anyway, so we just decided to focus this year on the UK market which is a result of COVID anyway, and then Brexit now on top of it.

Interviewer: Yeah. Given the fact how we have entered a second national lockdown a couple of months ago, compared to the first one, how well was your business prepared for it? And was there any of HIE's involvement in the level of preparedness that you have had?

Interviewee: No. But, again, everything has spun from this digital grant because by having the digital grant, we have been able to react and go and attract new customers which has happened effectively since November which was when the grant funding went into place. I had people ready as soon as I got the money and the go-ahead. They literally started working on that day. We had everything lined up to do improvements on the website, to engage to interact with consumers; and, for example, in December, we acquired fifty new customers and forty new customers in January on the back of it. So everything has really gone back to that digital grant that we got.

Interviewer: So there was HIE's involvement in the level of your preparedness?

Interviewee: Yeah. Absolutely. That has definitely helped us. It feels that my business had only been launched in the fact since September 2020. When we started looking at the changes that we could make, with what was happening with COVID, with knowing more about our customers, where to go for, or what to go for, and then with the funding able to put into work the things that needed to happen to enable that.

Interviewer: Over the last twelve months that we have been communicating, what changes happened in your business with HIE's support and resources available to you?

Interviewee: Really having that grant, the grant funding, is the key thing in the last year, I would say.

Interviewer: How did that change your business?

Interviewee: We are actually growing at this point which we were not. We had only launched fourteen months ago but, effectively, we lost the first seven months, from March through to September. What is that? Six months? Something like that. We lost six months but, effectively, by refocusing on the digital aspect, we are now on a growth trajectory and that is all working.

Interviewer: What is the most challenging aspect of communicating with HIE? Or with your account manager?

Interviewee: Gosh. He does respond, I guess, when I email him. I do get a response. I cannot really complain, I guess. He does respond to me.

Interviewer: But would you want more support? Would you want him to contact you?

Interviewee: Yeah. I think it would be useful to have maybe a little bit possibly more proactiveness from their part to contact me and say "Look. Let's set up. Where are you at? What can do to help?" Because to me there will be things going on there that I am not aware of and they are not asking for it, so it does rely on me going to them.

Interviewer: Do you think this was anyhow affected by the COVID crisis?

Interviewee: I do not know. I think it has been like that anyway and it probably has not been helped because of COVID.

Interviewer: What is the biggest lesson that you have learned because of the COVID crisis? Did your perspective change in the last ten to twelve months?

Interviewee: As a person or as a business? As a business, I presume. I am thinking but I would say it probably relates to communication to customer and then obviously how we will change our strategy going forward after this when we get out of it. Because we can obviously work quite well online. So the balance between what we need to do online and on the physical space, and the cost of that, will be under review after this.

Interviewer: And what is your and your account manager's plans for the future? Are there any key things that you are trying to focus on or did you make any plans together?

Interviewee: No. There has been no communication from them to ask how we are getting on. We are just, I would say, they have not contacted us to see how we are getting on at all even since we have had the digital grant. Although, I have sent them messages just to say that it is working really well, we are getting constant results, this is good, that is it, but nothing else has come back. I do not know if that answers that question.

Interviewer: Because you were account-managed before everything happened last March, so would you say that there is a difference between how it was then and now?

Interviewee: Yes. Probably less contact. I mean maybe others, through COVID, who have got bigger issues with staffing because we do not have that staffing issue. All our folks have been on developing projects and promoting it. The people I work with are freelancers so obviously we tap into them as we need them rather than permanent members of staff, so we have not had some of those bigger concerns that other businesses would have had.

Appendix six: Manual data analysis sample

Interviewer: and do you think you would need any help from HIE in that?

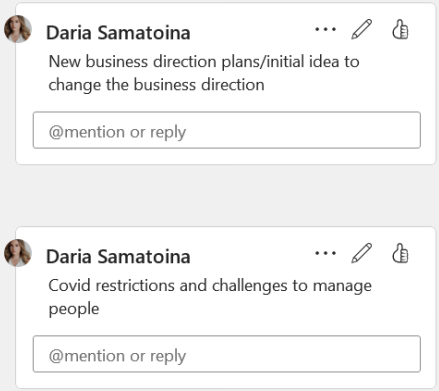
Participant: Yeah, that is one thing update meant to steer this month, and, it was just in a passing email because he emailed to get in touch regarding feedback, but I am going to be taking business in the different direction. Before all of this, I was going to purchase some equipment and stuff like that. I am really glad that I did not because, you know, it would have only taken maybe four months before we run out of money paying off the finance. So, I am going to take the business in a different direction, and I am going to do that in line with HIE, and just sort of use them to sort of see if I can identify some gaps in the market, and things like that. But that also gives me the chance to maybe take the business into direction, which I had liked more of myself because I am not perhaps a waste disposal interested person as that was not really my passion. I was just doing what I thought was generate the most amount of income, but I think it is about doing and trying to get the business thing that I enjoy more, even if it does not make that much money.

Interviewer: Yeah, and since the last time we have talked, was there any new challenges that appeared in your business?

Participant: No, it is still the same. I think that something's changed every single day. And you know, you have got the government saying something in the UK and then the other thing and the biggest problem, or the biggest challenge is just managing people through all of this, and doing the right thing. And you know, you are always going to get people that are not very happy, but have you put in enough control and stuff at that mean the biggest challenge is managing people.

Interviewer: Also, you mentioned that Steve wanted some feedback from you, what is it? What for?

Participant: It was more just from him, it was more just as part of his review, he wanted to get some feedback from his



Interviewee: The way we formulate our problems now is pretty much the same as before, so we will see how it goes after the lockdown is lifted."

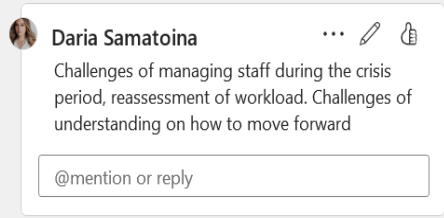
May 2020

"Interviewer: in terms of your account manager, has there been any progress or communication?

Participant: No, that is all, there is nothing, nothing really, but apart from I think some upcoming webinars and stuff like that, he is been sending information and stuff like that. But yeah, I have not spoken to him at all this month. But that is really just because I am starting to think about being back at work and home because of my maternity leave.

Interviewer: how are the things that work?

Participant: It is pretty much half the company and it is quite difficult in some ways, because the two guys who are still working are grumpy about the fact that they are still working, and then the other two sort of a bit bored now. Yeah, it is just, it is strange. When there is some work in the day like this week, you all are working, you know, trying to catch up on stuff before lockdown started, but there is nothing new coming in really like everything so stuff which was scheduled from before. So, I am using this week to gauge what is happening. We are just going forward, but no idea how it is going to go, and you know, I did not really believe that this would last this long as well.



Interviewee: This month was an absolute nightmare as I was trying to stay on top of all the things. Before everything got out of hands with the virus, I did not have that much communication with my account manager as I was completing the license course, which I mentioned about the last month. In terms of communication, this month we were due to have my business reviewed, but instead, we had a phone conversation where I was updating my account manager and him advising me on how to progress given the new circumstances and a new plan of action. So, essentially, my business review is postponed.

In regard to my business, all our orders have been cancelled, with all my staff and workers being sent home for further notice. So, there is nothing in the diary for next week and the week after. We are classified as essential business, so technically, we are open for work, but there have been not much of orders. So, I would need to figure out what to do next sometime soon, and there is really no one to help me.

Interviewer: So what help and support does HIE provide you with right now?

Interviewee: The help that HIE is providing right now is quite basic and general, so they are just sending emails with government updates relating to business changes. It is quite difficult just now because everything is changing so quickly, but if I would have any questions or concerns, I would just ask my account manager.

Interviewer: Do you have any particular expectations from your account manager or HIE?

Interviewee: I do not really have any expectations from HIE as such, but I would be very happy if there would be something at the end of all this just to get my business back on track, but I am not sure it will happen. All my growth plans are obviously on hold now and have been postponed. I am really glad that there are not any big loans and debts in my business. Very challenging times ahead."

Daria Samatoina
Company's action to cancel all orders due to uncertainty of the business future
@mention or reply

Daria Samatoina
Action on keeping constantly updated regarding gov regulations
@mention or reply

think I hope it's not going to be more talking and I hope it'll be more like specific actions. So Pathfinders the hitch-hike course that I went on and it is run by HIE, it is product development one and I basically came to the conclusion, and it took so long to come to the conclusion. I just need to crack on with stuff, so I just need to do it. So the end the Pathfinder was actually difficult because like I didn't feel like I had achieved very much but then in the last two weeks, I sort of changed my mindset completely and I'm getting the GPR that we put in quotes and stuff like that. So, fingers crossed I started some work and I think I start thinking about doing some water foot printing work at U** (company representative's company), and so that's the next phase of my development. But that thinking has all come around from Pathfinder and I'm going to tell all of that *S** (account manager)* tomorrow.

Interviewer: And in terms of any new resources that you have asked HIE to provide you with, was there anything new in the last two three months?

Interviewee: No, nothing new at all. Pathfinders actually been sucking up so much time as an is it's been really good because it's been like one Thursday a week, where you're just solely concentrating on the business, but one full day a week is quite a big commitment. But I'm going to ask *S** (account manager*) tomorrow what's available and things like that, especially support-wise.

Interviewer: For financial you mean or...?

Interviewee: Yes perhaps financial, so the water foot printing thing that I've been thinking about because I've spoken to a lot other businesses about the fact that it's really hard to grow a business and I'm really struggling. It's just no-brainer that you kind of need to do something new but it's not going to make us more money, but it will make us more technical. So, it's not going to grow the company in a financial way, but I'm hoping it will grow it in a people way as we can start employing more intelligent people. Which I know sounds really harsh but it's really difficult to manage construction labour types and I'd quite like for us not to just be employing labour types. But the water foot printing thing is more of an internal exercise and a potential business thing as in we use a lot of water in what we do, but I've got no idea how much water we use and so I'm thinking about seeing if I can come up with a software and it would be software at combined with data loggers. You know that it's a kit reading equipment and to start tracking how much water we use and then I'm hoping that potentially, it might grow some arms and legs because although we do a lot of carbon tracking at the

Daria Samatoina
Action: joined a pathfinder course to understand product development better and implement it
@mention or reply

Daria Samatoina
Action on reaching out to other business to understand on how to pivot better
@mention or reply

Daria Samatoina
Potentially a goal in pivoting business

Interviewee: Yeah, I am trying to pivot the business, but I don't know what it is. I don't know what into yet, but I'm hoping this little side project or will potentially give us some more ideas because I've examined all the ways of growing the business in the classic way that people would grew my type of business and that's just not what I want. So this is more in line with something to do with my values something which I might be a lot more interested in as opposed to the other stuff. So, yeah, I'm basically trying to find any opportunities to pivot at the moment. So I'm going to do an internal exercise and see if that comes up with anything.

Interviewer: And reflecting back to 12 months that we've been talking. What's the major benefit or advantage that HIE has provided to you with? So, any particular support offering that benefited you or maybe change the way you manage your company?

Interviewee: Pathfinder was actually really good and I think you can be part of Pathfinder even if you're not account

Daria Samatoina
Business easement - research on other businesses
@mention or reply

Daria Samatoina
Pivot through various internal exercises
@mention or reply

Interviewer: how was your business affected so far?

Interviewee: Fortunately, 90% of the work I can do from home, so it has not been that terrible, but it is challenging with schools being closed. We tried to use some of our equipment and create shields and other materials that local hospitals can use. So, in the past few days, we were just running around, trying to find supplies to make that happen.

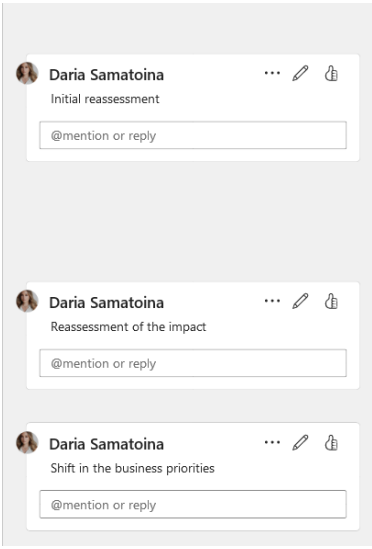
Interviewer: is there anything you are expecting from HIE?

Interviewee: I am not quite sure what to expect from HIE, so we are just trying to work and relay on ourselves. So, for now, I am not expecting much from them.

Interviewer: Any growth-related changes within your business? What is the plan moving on from here?

Interviewee: In terms of our growth strategies, we were supposed to get a graduate to come and work for a few months, so now this has been put on hold. This means that any additional work around the things we were supposed to develop along with a graduate are now postponed as well. So, the growth of a team and a few other projects are delayed for some time. But like I mentioned before, most of our work we can do from home. We were also supposed to travel to the US, which HIE was funding as a part of Brexit support and we were supposed to visit a number of different conferences and trade shows, so now all of them have been cancelled. Also, we were supposed to take part in a local conference where HIE has a stand, and we were able to advertise ourselves, so now this has been postponed as well.

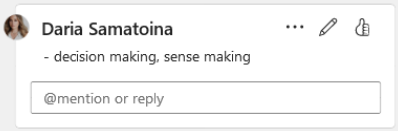
So, right now, what we are trying to do now is just support and help the local community health-wise as we are quite well placed in the Inverness now. We can still work and accept orders, but our priorities have shifted more towards life science".



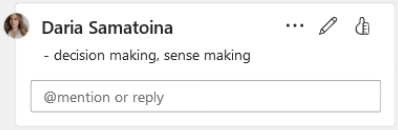
be companies there that have a niche.

Interviewer: Yes. In terms of any new challenges that sort of appeared in the last three weeks.

Interviewee: I suppose the ongoing challenge is just the uncertainty. That is the problem. I can understand that we cannot get certainty because they are just watching for the numbers. But the problem is that everybody is looking for a



date, when we will be back to work and we were trying to find out what volume of work is going to be there for the date, when we do go back to work and it is kind of like the chicken and egg. You are sitting there, the guy followed me today, a small construction customer, asking where are we doing concrete supplies. Actually, we are only doing essential concrete supplies at the minute, and I say, "B**b, what are you planning?" "Well, I do not know, I was following up to see what you were going to give us." I am like, it is kind of, everybody is just kind of looking at each other. Going, "What are we supposed to do?" Because the delivery of concrete, we can do pretty well manage for social distancing? It is quite a solitary operation. But the laying of concrete is not a solitary operation that requires a degree of planning, because that is usually done in sport.
So yes, it is interesting, as these guys who were ordering concrete, you have to ask yourself, they may be very well set up for social distancing. Or they may not be bothering at all and we do not know until we get there, so it is going to be



August 2020

"Interviewee: We are trying to deal with lots of business development things that we are going to working on. But there is a lot of kind of inquiries out there that are all getting, a little bit of attention so it is taking a bit of time. Trying to focus a little bit more on us taking a lead in targeting for areas we want to work in rather than just sit back and waiting for inquiries to come in. Engagement with Account Manager, I am not sure. I certainly have not spoken to him for the last months. P** (*the company's representative colleague; he is in contact with HIE as well)*, one of my colleagues, one of the directors, I am not sure if he has yet but if he has not yet we will be picking up a conversation with somebody. Because we are looking at some stuff to do with sustainable developments, timber housing, making use of certain economy and resources around in this area.

Interviewer: So what resources do you think you will be asking from your account manager?

Interviewee: We are at the point where we sort of making-- we have got some ideas, we were looking at possible funding streams. We will be chatting with somebody, trying to figure out what kind of support might be available. And I think we are usually quite good at figuring out who the right person to talk to. We often go straight to them rather than through the Account Manager. But the best case might be the Account Manager, is one of the best people to talk to about it. It will probably be directed towards the innovation funding? I am not sure.

Interviewer: Yeah. So you have not requested anything? Any help from them as yet?

Interviewee: There is a possibility that we are looking at taking a lease on some lands on the campus and building our own office. A three-year lease, so it will

Daria Samatoina
Pipeline of projects currently developing
Sense making
@mention or reply

Daria Samatoina
Sense making
@mention or reply

Interviewee: So I think there is far more likely that we are going to be asking for support for direct product development. Select the small innovation grants, and support with that. Because we work in an area where we like to make, we like to innovate, we like to make improvements, we like to solve problems. And when you have kind of got normalities happening, then everything's kind of running along, lots of people making small incremental changes. When there is a big shakeup, to normality, like this COVID crisis, when quick change, quick innovation can have a real impact. And that is what we can be quite good at. This is why we have turned from being a desk-based design consultancy, into turning out those face shields in a couple of weeks. I think that was our first small innovation grant was for helping with the development of this, and I have just sent off a face shield that will get certified. So by the end of this, you know, the first month of this crisis, we will have our PPE marks, pipe certified, tape approved. The product that we are selling directly, which is a new thing that is completely new to us. We have just always provided engineers solutions like this other clients and clients have gone off and sorts of things. But we have become a producer, selling directly to the NHS. So that is a pretty big change.
Yeah, I could see more of that. There are other opportunities. We are talking about where that might be relevant, that we might have an idea that we want to develop further. And we are certainly willing to put some money into it and go for the cool funded small innovation grants approach.

Daria Samatoina
Business pivoting for the product development
@mention or reply

Daria Samatoina
Direct pivoting and decision making
@mention or reply

Daria Samatoina
Grant support applied to make that happen
@mention or reply

Interviewer: So for those face shields, you sell it to NHS, or is it just like a voluntary work? And did HIE help you?

Interviewee: So for the first lot, we are under the real need locally from the particularly the ICU department, and their supply chain was completely broken. And they could not get the stocks they needed, so we filled the gap. And we came up very quickly with a design that could be mass-produced in quantity. So a lot of people were coming up with 3D printed designs, but we quickly discarded them because there was too slow. Whereas, we were able to come up with using a laser cut service with the design that was quick to produce. And that meant that we did get to get the best to people that needed it quickly. For that, we did not want to be taking advantage of situations, particularly, so we said that we would cover our costs. And obviously, it was a product that we were

Daria Samatoina
Business opportunities reassessment

briefings on COVID. But I have not had any contact with them at all. But in fairness, all of our phones have been on there and although he has my mobile number, and have not done any force at all.

Interviewer: So you did not put any query for any sort of support that you might need.

Interviewee: Not through HIE. No, we basically played out on with our own federal so we have gone via the bank for the CBILS application, and we have had a look at the various grants, there is a couple areas where we might get a small grant assistance. So, we put an applications for that, but we have done that largely ourselves.

Interviewer: I think HIE is offering some grants as well. Second round for an application.

Interviewee: Oh, really?

Interviewer: I think so, yes. There are something happening around that.

Interviewee: Oh, I have a check. I did not know about that, I am sure if D**d thought we were qualified he would give us a shout, it is pretty good, usually, but no, I have not heard any of him recently, but I am sure he is being bombarded by companies who are maybe in a more serious state than we are.
I mean it is going to get worse, as they start to take out the furlough. Then, everybody is going to have to make decisions as to whether they have got a viable business, and they are allowing them to take their stuff back on before the end of October but even before the end of September, if you are going to be paying some proportion of their furlough. That is when the decisions are going to have to be made.

Interviewer: If you were to ask for any sort of support, what would you ask them?

Daria Samatoina
Grants, loans
@mention or reply

Daria Samatoina
- decision making, sense making
@mention or reply