

University of Strathclyde
Department of Management Science

The Deployment of Dynamic Managerial Capabilities in Practice

By

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Doctor of Philosophy

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Abstract

According to Helfat et al (2007, p4), dynamic capabilities represent “the capacity to purposefully create, modify or extend the resource base” of an organisation. As such, dynamic capabilities are a means by which organisations might respond to or create market change. This thesis aims to make a contribution to understanding of how dynamic capabilities operate in practice. A conceptual framework focussing on deployment practice at a managerial level is developed from the findings of a structured literature review and a methodology comprising participative data collection methods and qualitatively oriented mixed analysis methods is proposed. Empirical investigation conducted over 18 months concurrently in two manufacturing organisations informs the development of research propositions. These are subsequently reviewed through a strategy as practice lens and models of deployment practice and situational needs are presented. The findings of the thesis suggest that dynamic capabilities are situated, complex and tacit mechanisms which are embedded in an organisational context. As a result, it is argued that deployment practice has to be situational in order to balance efficacy and efficiency of attempted strategic changes to the resource base. A theoretical model is presented which suggests managerial process, managerial practice and situational requirements, underpinned by managerial perception, as factors influencing the likelihood of deployment success of dynamic capabilities at a managerial level. Also noted is the importance of historical activities and learning in shaping deployment practice, and mitigating factors are recognised as potential enhancers or inhibitors of deployment activity. In spite of limitations of the approach adopted, the implications of the thesis in general and the theoretical model in particular are argued to provide a point of departure for future research. It is suggested that further investigation into the practice of dynamic capabilities has the potential to benefit both academic and practitioner communities.

Chapter 1 - Introduction

“Successful competitiveness in the 21st century will demand the use of visionary and dedicated leadership, a balanced scorecard that enhances corporate accountability and sustained investment in creating dynamic capabilities”

Shaker A. Zahra, 1999, p36

Academy of Management Executive

Of Survival and Growth

According to Teece (2007, 2009c), organisations in the 21st century are exposed to more aggressive, rapidly changing markets than ever before. There is a **permanent need to change** as factors external to the organisation such as customers, suppliers, economies, governments, competitors, institutions and technologies remain in a state of flux with the potential to change, perhaps discontinuously, with little notice.

Operating in such an environment, many organisations experience the “Red Queen Effect”, named after the character from ‘Through the Looking Glass’ who observes that “it takes all the running you can do to keep in the same place” (Carroll, 1946). This effect means that firms may expend increasing amounts of energy in changing and adapting, but as a result of similar activities by competitors and an unpredictable/uncertain environment, little or no progress is made in terms of organisational growth (Teece, 2009b).

As a consequence, for the modern business the execution of continual change may be considered a matter of necessity for survival. However, if the struggle for survival is a permanent condition measured by the ongoing existence of organisations, **why do some organisations grow whilst others stagnate?** In other words, why are there differing levels of demonstrated business performance when most firms are exposed to the same volatility of environment?

This question is a key concern of the field of strategic management and one which is addressed by different disciplines in a multitude of ways (Nelson, 1991; Augier and Teece, 2008).

From a capabilities perspective (Teece et al, 1997), not just organisational survival but also growth is dependent on how well a business can manage its resources through its organisational capabilities. In the here and now the customer may choose to purchase the goods or service produced by the operational capabilities of the firm. What influences the customer's purchase decision today is unlikely to remain static for long and therefore to attain or maintain a future position of advantage through valuable, rare, inimitable and non-substitutable core capabilities (Barney, 1991), a firm must utilise its **dynamic capabilities** to understand and put in place appropriate configurations of resources to meet future needs of stakeholders. According to Eisenhardt and Martin (2000, p1111), dynamic capabilities “are best conceptualised as tools that manipulate resource configurations”, describing the critical organisational antecedents by which managers can alter their resource base.

As an ex-industry practitioner, the author draws motivation from personal experience to investigate this matter further. Having worked in a production facility in the North of England for a number of years in production and engineering management, the effects of global competition and threats to organisational survival were very real daily concerns for the author in his working life. However, whilst the need to change and adapt was wholly evident and the consequences of failing to do so equally apparent, ambiguity abounded regarding which actions to take as a manager. The options available were in part constrained by factors of geographical location and physical and human resource availability. Furthermore, there were intangible constraints reflecting the skills and abilities of the organisation as a whole, as well as at a strategic business unit, production unit, shift team and individual level. In such complex and uncertain conditions, a recurrent question was “**As a manager, what should I do to effect appropriate change?**” Further experience working for a high

growth SME¹ in a commercial role and for the University of Strathclyde in a knowledge transfer role engaging with over 50 SMEs in the West of Scotland reinforced the importance of this question to the author.

Seeking Answers Through Dynamic Capabilities

Teece, Pisano and Shuen's seminal paper (1997) describes dynamic capabilities as the exploitation of existing internal and external firm specific competences to address changing environments through developing, deploying and protecting combinations of competences and resources. More recently, a group of eminent authors in the field proposed that dynamic capability should be defined as **“the capacity of an organisation to purposefully create, extend or modify its resource base”** (Helfat et al, 2007, p4).

According to Harreld et al (2007), a dynamic capabilities perspective offers the potential to build understanding of how organisations' can survive and grow in the face of the uncertain, complex, turbulent and global market conditions which seem to characterise the modern business landscape. Easterby-Smith et al (2009) describe a dynamic capabilities perspective as an extension of the resource based view (addressing its criticisms of static and tautological theorising through considering intermediate change outcomes over time) which can contribute to explaining **“evolution with design”** – that is, the purposeful adaptation of aspects of the organisation over time (Augier and Teece, 2008, p1196).

Whilst theoretical development of “content” aspects of the dynamic capabilities concept have continued apace in the last decade, there is an increasingly widely held view that development of theory to aid understanding of **dynamic capabilities “process”** requires attention, particularly through longitudinal fine grained study (Easterby-Smith et al, 2009). In combination with a related view that the field is also skewed in favour of quantitative approaches, Ambrosini and Bowman (2009, p46) propose that by investigating **“the detail of how dynamic capabilities are deployed**

¹ Small to Medium Size Enterprise – defined by the European Union as an at least 75% privately owned firm with <250 full time equivalent employees and a turnover of <€50M

we should be able to understand better dynamic capabilities in practice and whether and how they might differ across firms.” In other words, qualitative, in depth investigation of how dynamic capabilities are used in organisations is necessary to advance the field. Such micro-level investigation is made difficult by practical restrictions on time and subjective researcher perceptions of events. Also, there is a conceptual challenge for dynamic capabilities researchers in defining terminology and clarifying theoretical underpinnings as a precursor to making a robust contribution to knowledge (a task initially addressed in this thesis in chapter 2).

This thesis aims to answer the above call and make a contribution to the strategic management literature and managerial practice in the field of dynamic capabilities. Specifically, an initial overarching question of, “**how are dynamic capabilities deployed in practice?**” is investigated, with an intention to develop a particular focus and framework on what managers actually do through their daily activities.

High Level Description of Research Approach

In attempting to build understanding of how dynamic capabilities are deployed in practice, the following approach, summarised in diagram 1.1, is adopted.

(1) **Elucidation of a conceptual framework indicating likely factors of influence on the deployment of dynamic capabilities in practice.** Drawing on an approach suggested by Tranfield et al (2003), a structured review of extant dynamic capabilities literature (covering the top 50 management journals as ranked by the SSCI) is conducted. This is used to clarify theoretical underpinnings adopted in the thesis and necessarily draws on related literature on processes, capabilities and resources. At a managerial level of analysis, a conceptual framework is subsequently developed for dynamic managerial capabilities with a related unit of analysis of “attempted purposeful strategic changes to the resource base instigated by a manager”.

(2) **Collection of empirical data of resource base changes.** Based on eighteen months concurrent engagement with two manufacturing firms in the construction materials sector in the West of Scotland, qualitatively oriented mixed methods are

used to gather data about changes to the resource base of these organisations. Based on the view that dynamic managerial capabilities represent the capacity of a manager to purposefully create, extend or modify the resource base of an organisation, data on a total of 205 attempted but not necessarily successful changes to the organisational resource base initiated by top managers are described in terms of the factors developed in the conceptual framework.

(3) Analysis of the mechanisms driving intended resource base change efforts and factors influencing the outcomes. Adopting a range of analytical methods to shape understanding, data is interpreted to address sub-questions of “How do the necessary factors of dynamic managerial capabilities deployment affect purposeful change to the resource base?”; “How do sequential deployments of dynamic managerial capabilities interact?” and “How do concurrent deployments of dynamic managerial capabilities influence each other?”. A set of propositions are developed in one case context which are examined for replication in the second context as a means of cross case analysis. Based on the outcomes, answers to the research sub-questions are offered.

(4) Discussion of Findings from a Strategy as Practice Perspective. To further shape the contribution of the thesis, the empirical detail and related qualitative analysis is discussed from a ‘Strategy-As-Practice’ (SAP) perspective. This involves drawing on realist social theory to develop models of managerial deployment approaches, using SAP activity based approaches to create activity systems diagrams and comparing the relative performance of activity configurations in different organisational contexts.

(5) Implications and Conclusions. Guidance for managerial practitioners is suggested relating to how, at a micro-level, they might assess the contextual needs of an intended resource base change and subsequently adopt a deployment approach which maximises efficacy and efficiency. Methodological and theoretical contributions are also highlighted. From a methodological perspective, mixed methods with a qualitative emphasis (including participative approaches) are

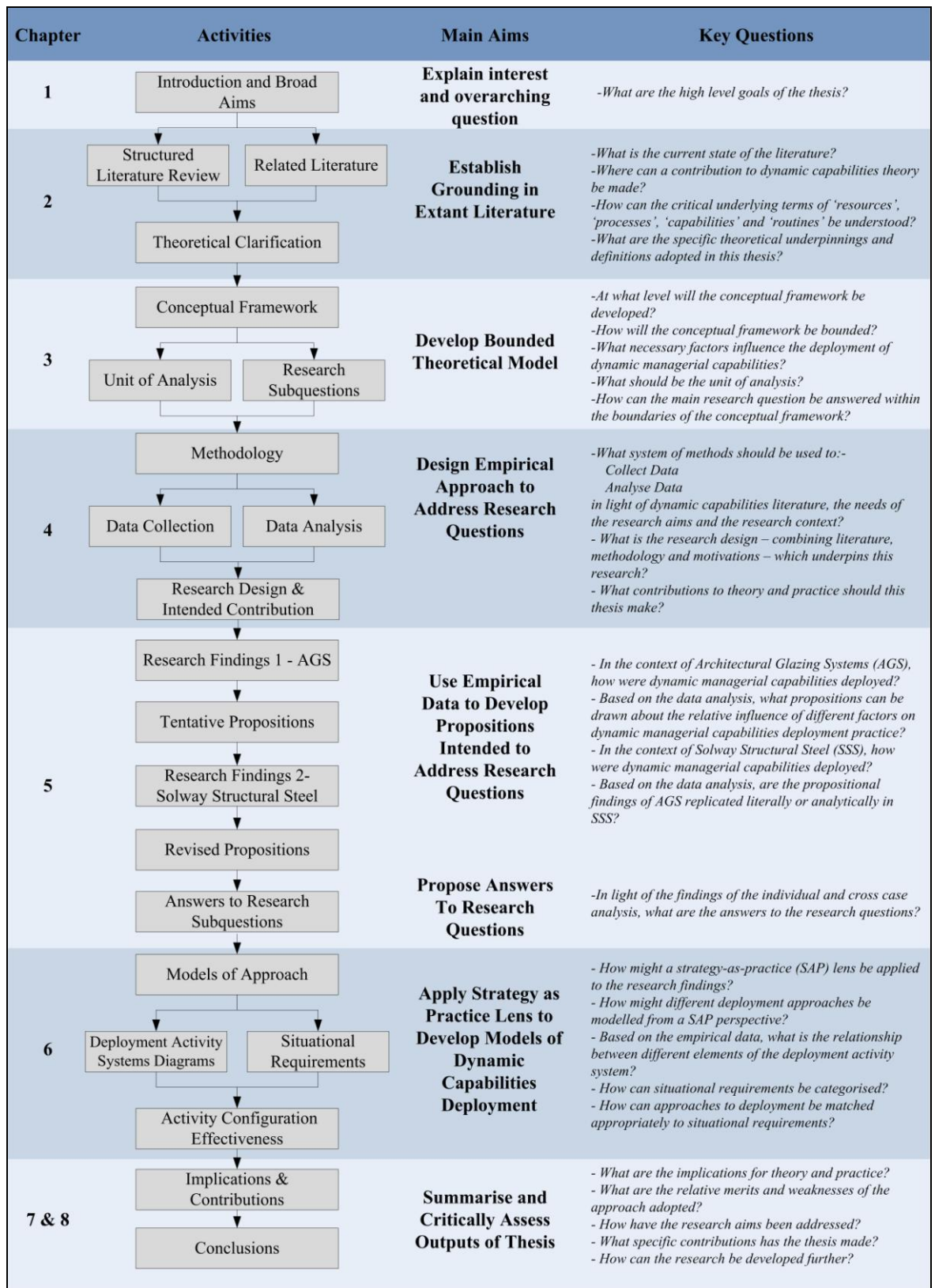


Diagram 1.1 – Overview of Thesis

promoted as appropriate means for researching the detailed/fine grained practice of dynamic capabilities. From a theoretical perspective, aspects of extant theory relating to dynamic capabilities as a complex, situated and path dependent meta-construct are developed and confirmed as a useful point of departure for future studies.

As a unique contribution, a theoretical model of deployment practice at a managerial level is presented. This is also accompanied by activity systems models representing the contingent relationship between management, organisational structure and resource base change outcomes in the practice of deploying dynamic capabilities. This theoretical contribution explicates the centrality and criticality of a situational and contingent managerial approach at an activity/micro-process level, supported by a body of empirical evidence and analysis. Representing a “mid-range” theoretical outcome (situated in the context of investigation), analytical generalisability is suggested and a research agenda for further testing and developing these models concludes the thesis.

A Note On Philosophical Position

The author has already revealed his industrial background as it undoubtedly plays a significant role in directing this thesis towards achieving practice oriented outcomes. In keeping with the practicalities of good research design as espoused by Maxwell (2005), such motivations are explicated in order to inform the reader of the views of the author, that the reader might better understand the author’s perspective and related argumentation.

More broadly, sharing the **philosophical position** from which a study is conducted is an important task as according to (Ackroyd and Fleetwood, 2000, p10), “the way we (implicitly or explicitly) presume the world is (our ontology) has a strong influence not only on our ways of studying it (our epistemology) but on the way the whole analytical framework we adopt is conceptualised.”, a view shared by Reed (1997), Easton (2000), Willmott (2000), Kwan and Tsang (2001), Dobson (2001) and Easterby-Smith et al(2002).

This thesis is written from the philosophical position best described by the term “**critical realism**”. Drawing on the works of authors such as Bhaskar (1975), Archer (1995) and Sayer (1992, 2000), critical realism is taken to represent the set of beliefs that there exists a real world about which we can develop our individual and shared understanding and knowledge with the caveat that we necessarily do so in a flawed and incomplete way.

Importantly for dynamic capabilities research, it is explicitly allowable from a critical realist perspective that any aspect of **the social world can be considered real** when the impact of its constructs are real. Critical realism holds that through the inter-subjective nature of language, shared understanding of otherwise ethereal concepts can act as generative mechanisms causing real world effects. Therefore, the author shares Harreld et al’s (2007, p42) perspective that “dynamic capabilities are not abstract academic concepts but a concrete set of mechanisms that help managers address the fundamental question of strategy”. Just as politics and culture are widely accepted as social constructs with real world effects, so can dynamic capabilities influence and impact the life of an organisation and the societies in which it engages.

Further explanation of the impact of a critical realist perspective is offered at relevant junctures throughout the thesis. This initial statement of the author’s philosophical grounding in critical realism is offered at the outset in order to inform the reader of the **meta-lens** through which the research activities have been conducted.

In Summary

Organisations are operating in an increasingly challenging business environment characterised by uncertainty, ambiguity and perpetual flux- a study by McKinsey cited in O’Reilly and Tushman (2008, p186) claims that the average life span of a corporation in the S&P500 has fallen from 90 years in 1935 to just 15 years in 2005. For managers seeking not just to survive but also to grow in such conditions, the notion of dynamic capabilities represents a potentially valuable set of tools for managing their resource base in pursuit of such goals. However, the field of dynamic capabilities is in need of conceptual development, particularly in micro-level understanding of how dynamic capabilities might be deployed in practice.

This thesis aims to make a contribution to knowledge about the deployment of dynamic capabilities in practice informed by an in depth, participative longitudinal study. In keeping with a fallibilist epistemology and adopting the realistic views of (McGrath, 1981), it is accepted that this research is flawed and has weaknesses as has any research (Easterby-Smith et al, 2002). However, the author's background as an ex-industrial practitioner and philosophical leaning towards critical realism are recognised throughout as key influences on research design decisions and critical commentary. This is an attempt to meet McGrath's (1981) challenge to conduct flawed research in an acceptable way by making explicit the rationale behind choices and shaping the different aspects of the thesis into a sensible and coherent whole. The following chapter initiates this process by offering a structured analysis of dynamic capabilities literature in line with a critical realist imperative to understand extant research, and more widely the state of the field, before attempting to identify where a contribution to knowledge may be made.

Chapter 2 – Establishing the Background in Literature

“The literature review process is a key research tool... which enables the researcher to map and assess the existing intellectual territory and specify an appropriate research question to develop the existing body of knowledge”.

Tranfield, Denyer and Smart, 2003, p208

British Journal of Management

Chapter Abstract

The aim of this chapter is to develop a review of dynamic capabilities literature in order that the thesis might have a strong foundation in existing theory. **A structured literature review** is deployed to develop such understanding in a transparent and repeatable way, although it is also necessary to draw in literature from fields related to dynamic capabilities in order to clarify definitions of supporting terms such as ‘resource’, ‘capability’, ‘process’ and ‘routine’.

The literature review finds that dynamic capabilities, as a field of academic interest, is increasingly dominated by quantitative empirical research despite strong calls for qualitative, longitudinal field work to explore the detail of ‘how’ dynamic capabilities are developed and deployed. Such calls suggest that a **potential contribution** may be made through **qualitative investigation** of the **micro-processes and daily activities** which underpin dynamic capabilities.

Whilst dynamic capabilities literature has previously been criticised as being theoretically fragmented, the review also suggests that a definition of dynamic capabilities as “the capacity of an organisation to purposefully create, extend or modify its resource base”, as proposed by Helfat et al (2007, p4) can effectively unify a number of prominent perspectives and related concepts. Using this definition as a foundation, literature is reviewed to prepare a map of dynamic capabilities concepts and characteristics. This output is intended to make explicit to the reader

the theoretical assumptions underpinning argumentation throughout the remainder of the thesis.

Of particular note is the finding from literature review that managers are central to the construct of dynamic capabilities. Indeed, dynamic managerial capabilities – “the capacity of managers to purposefully create, extend or modify the resource base of an organisation” (Helfat et al, 2007, p7) – are argued to be at the very root of higher level organisational dynamic capabilities. From this perspective, it is inferred that managerial activities in deploying dynamic capabilities, based on their perceptions, abilities and choices, will have a profound impact on how and how successfully dynamic capabilities are used in an organisation. In addressing the question of “**how are dynamic capabilities deployed in practice?**” these findings suggest that a managerial level of analysis is an appropriate boundary to consider for this thesis. This view leads into the development of a conceptual framework in the subsequent chapter.

Literature Review – An Introduction

According to authors such as Hart (1998) and Easterby-Smith et al (2002), the literature review is a key part of doctoral study as it allows the author to understand work in the field to date, identifying gaps and potential areas where a contribution to knowledge could be made and develop a clear and precise conceptual vocabulary. In researching dynamic capabilities, the literature review is particularly important as the field is still developing and is characterised by broad and varied definitions in terminology, reflecting the wide range of contributors exerting their theoretical influence (Easterby-Smith et al, 2009).

Accordingly, this chapter presents the findings of a bounded and structured review of extant literature in a manner consistent with the recommendations of Tranfield et al (2003). Such an approach is adopted to make explicit the details of the body of literature which has influenced the author’s work. It provides a foundation for critiquing the state of dynamic capabilities as a topic of research and identifying both theoretical and methodological gaps against which the author can make a contribution. It also forms the basis of a number of conceptual distinctions and

choices which the author necessarily has to make in order to construct a consistent and coherent framework and relevant research questions (chapter 3).

The following sections lay the groundwork for developing such a framework by explaining the approach and the boundaries of the literature review itself.

What are the Requirements of a Literature Review?

According to Maxwell (2005), the literature review shows how proposed work fits into existing theory and explains the theoretical framework which informs the research proposition. This view is consistent with the arguments of Hart (1998) who suggests that the **literature review is an important tool** for the developing researcher to learn subject history and vocabulary. This same author characterises an effective literature review as one with “appropriate breadth and depth, rigour and consistency, clarity and brevity, and analysis and synthesis.”(p1)

In conducting a literature review, Easterby-Smith et al (2002) argue that there are numerous ways in which to proceed according to context and area of interest. These authors propose that of central importance in the literature review is a **systematic approach**, from planning through note taking to analysis. Commenting on methodological context, Cresswell and Plano Clark (2007, p29) suggest that literature reviews in qualitative studies should “provide evidence for the purpose of the study and the underlying problem addressed by the inquiry”. These authors also argue that, unlike in quantitative research, the literature review in qualitative studies **should not limit or constrain the types of information sought through inquiry**.

The form of the literature review is important as Tranfield et al’s (2003) paper highlights that management literature reviews have been criticised for being (a) narrative, limited accounts of a field (b) influenced by the inherent biases of the researcher (c) lacking in critical assessment. These issues are perpetuated by a lack of appropriate knowledge management infrastructure. These authors go on to challenge management literature reviews to adopt a methodology that is “**systematic, transparent and reproducible**”(p209) whilst at the same time appropriate to the frequently subjective and qualitative nature of the knowledge base context.

A systematic literature review approach is selected for this study for two main reasons. Firstly, in terms of making a contribution to theory about dynamic capabilities as practice, it is intended that the structured review will systematically draw in a broad range of relevant literature. According to Denyer and Tranfield, (2006, p223), “existing management research will not **contribute to management practice** if individual studies simply accumulate in academic journals”. Therefore, in shaping a practice-oriented contribution, a systematic approach should draw in useful extant theory to serve as a strong point of departure for this thesis.

Secondly, from a critical realist perspective, there exists a challenge to draw in extant empirical research whilst applying, if only in a limited way, critical assessment of practical adequacy - “to be practically adequate, knowledge must generate expectations about the world and about the results of our actions which are actually realised” (Sayer, 1992, p69). According to the arguments of Tranfield et al (2003), the “systematic, transparent and reproducible” process of a structured literature review provides boundaries within which all relevant contributions are returned for review. This is as opposed to a “snowball” technique, “such as pursuing references of references” where the author pursues related lines of enquiry without clearly defined boundaries (Greenhalgh and Peacock, 2005, p1064). These authors further argue that a “snowball” approach may yield the highest rate of return on effort (in terms of relevant papers found per hour searched) and it can allow tangential or related literature to be drawn on to illuminate theory in the creation of novel contributions. It is applied in this thesis as a secondary approach when developing concepts related to dynamic capabilities. However, the structured literature review is adopted as the principal mechanism for examining dynamic capabilities literature as its systematic nature provides a framework within which bounded critical assessment (including matters of practical adequacy) can be conducted with a view to making a valid and justifiable contribution to knowledge.

Literature Review Methodology

This section makes plain the parameters of the literature review conducted in order to meet the first criteria of being “systematic, transparent and reproducible” as recommended by Tranfield et al (2003).

Step 1 - Researcher Orientation

As will be discussed later in this chapter, dynamic capabilities is an integrative field with diverse influences (Teece and Dosi, 1994; Zollo and Winter, 2002; Augier and Teece, 2009) and as a result, it is arguably characterised by a lack of conceptual clarity, mixed terminology and conflicting theoretical interpretations (Winter, 2003, Easterby-Smith et al, 2009).

Source	Description
Seminal Journal Papers Teece et al, 1997 Eisenhardt and Martin, 2000 Zollo and Winter, 2002 Bowman and Ambrosini, 2003 Adner and Helfat 2003 Helfat and Peteraf, 2003 Winter, 2003	Journal papers which, by citation, are suggested to be influential in the formation of the dynamic capabilities perspective
Literature Review Papers Wang and Ahmed, 2007 Furrer et al, 2008 Ambrosini and Bowman, 2009	Extant literature reviews on dynamic capabilities
Integrative Books Helfat et al, 2007 “Dynamic capabilities - Understanding Strategic Change in Organisations” Teece, 2009 “Dynamic Capabilities & Strategic Management - Organising for Innovation and Growth”	Books by eminent authors in dynamic capabilities which integrate perspectives and recount theoretical progress to date
Special Edition British Journal of Management, Special Edition – “Dynamic Capabilities” 2009	A focused, highly rated special edition presenting a contemporary range of views and research approaches

Table 2.1 – Researcher Orientation Literature

Accordingly, there was an initial need to develop researcher understanding of the vocabulary and nature of dynamic capabilities literature before defining literature review boundaries and search terms. As such, focused developmental reading was conducted on the sources identified in table 2.1. This initial list was based on an unstructured search of the Proquest ABI database and advice from senior colleagues with expertise in strategic management.

Step 2 - Identification of Full Literature Search Boundaries

The introductory review suggested that unlike capabilities, a term which is used interchangeably with “competence, collective skills, complex routines, best practices or organisational capabilities” according to Schreyögg and Kliesch-Eberl (2007, p914), “dynamic capabilities” appears to be used consistently, with the exception of the distinction between organisational and managerial levels.

Based on the findings of the initial review, structured search boundaries relating to date, source and search terms were established as highlighted below

Date

The range of search dates was set as 01/01/1989 to 21/03/2010. The rationale behind this choice is that according to Teece, (2009a), his 1997 paper in collaboration with Pisano and Shuen represents the culmination of around 8 years development of the notion of dynamic capabilities in strategic management circles. This suggests that a reasonable boundary to start searching for dynamic capabilities specific literature is 1989. The upper date boundary represents the final updated review date as constrained by thesis writing deadlines (in reality, the upper boundary started at 31st March 2009 and was revised twice as thesis writing progressed).

Source

As suggested by Tranfield et al (2003), researchers frequently measure journal quality by referring to a ranking system such as the Social Science Citation Index (SSCI) or the Association of Business Schools (ABS) ranking system. According to the SSCI website (SSCI, 2010), “journal performance metrics offer a systematic, objective means to critically evaluate the world's leading journals and through

“quantifiable statistical information based on citation data, help determine a publication’s impact and influence in the global research community”. The ABS Ranking system awards a journal a star level based on a combination of peer review, citation statistics and editorial positions. The higher the number of stars, the more confidence the reader should have in the quality of the paper (that it is “readable and worth reading”). (ABS, 2010)

As journal rankings are proposed against systematic, transparent and arguably reproducible criteria, the use of a journal ranking system as a search boundary is adopted in this thesis. Such an action identifies journal contributions in publications rated favourably in terms of peer review, citation and expert opinion. Ultimately, this is intended to identify literature sources which are reflective of a range of expressed views within the research community and are also recognised as being grounded in academic rigour.

Consequently, the list of sources searched in the literature review was initially set as the top 50 ranked management journals by impact factor as suggested by the SSCI. The selection of this journal ranking system over the ABI system was a matter of practicality as the SSCI system classifies journals by category and ranking whereas ABI is ranking alone (thereby making it challenging, particularly for the early-career researcher, to identify relevant journals). In addition though, the ABS rating for each journal identified in the SSCI list was cross-referenced to check the views of the alternative system.

This list was supplemented by peer review recommendations as suggested by Lee’s approach (Lee, 2009), resulting in a source list of 57 journals as identified in table 2.2 (which also shows the results of the search). Ultimately, 19 of the target journals yielded no relevant documents upon search. However, their inclusion in the search process is still made explicit as a means of providing an insight as to different communities’ views on dynamic capabilities as a priority topic – the points arising will be addressed in the chapter 7.

Search Terms

Finally, as already indicated, the search was conducted using the term (“dynamic capabilities*” OR “dynamic managerial capabilities*”) in the “citation and abstract” field to return the variants of dynamic capabilities identified in the initial review. The citation and abstract field was selected to return papers in which dynamic capabilities is the central topic or as a theoretical perspective used to supplement alternative theories.

Step 3 - Structured Literature Review Outcomes

Table 2.2 presents the number of journal papers returned by running the search within the specified boundaries. The results are sorted by the number of articles per source, followed by SSCI impact factor and ABS star rating. In total, 183 papers were returned. As a source of general interest, the characteristics and significance of the findings are discussed in the chapter 7.

Step 4 – Analysis of Contents

With a clear set of relevant papers identified, the not insignificant task of reviewing the content in a systematic way was undertaken. In order to build understanding of the field, related concepts and potential areas for contribution without introducing any preconceptions from other authors, an emergent approach to coding and synthesising literature was targeted (Maxwell, 2005).

In keeping with the stated aim of conducting a literature analysis as an appropriate precursor to qualitative empirical research, the principal aims of the content review were:-

- (1) to read and understand the material and synthesise contributions into a coherent ‘map of concepts’ which might be used to communicate the theoretical perspectives adopted throughout the rest of the thesis
- (2) to collect ‘meta-data’² about the papers in order to facilitate a limited assessment of practical adequacy of contributions

² Meta-data, according to the online dictionary of computing, refers to ‘data at one level higher’ – in the case of journal paper content, meta data refers to the title, journal, author, author location etc.

	Journal Name	Articles	SSCI	ABS		Journal Name	Articles	SSCI	ABS
1	Strategic Management Journal	33	3.344	4	30	Managerial and Decision Economics	2	0	2
2	Industrial and Corporate Change	14	1.165	3	31	Marketing Science	1	3.309	4
3	Journal of Management Studies	11	2.558	4	32	Journal of Management	1	3.08	4
4	British Journal of Management	11	1.839	4	33	Research in Organizational Behaviour	1	2.44	3
5	Organisation Science	9	2.575	4	34	Journal of Management Information Systems	1	2.358	3
6	Journal of Product Innovation Management	8	2.65	4	35	Long Range Planning	1	1.617	3
7	Technovation	8	1.907	2	36	Industrial Marketing Management	1	1.403	3
8	Journal of International Business Studies	7	2.992	4	37	Human Relations	1	1.372	4
9	R&D Management	7	2.043	3	38	Business Strategy and the Environment	1	0	2
10	Academy of Management Review	6	6.125	4	39	Journal of Marketing	0	3.598	4
11	International Journal of Operations and Production Management	6	1.725	3	40	Organisational Research Methods	0	3.019	4
12	Journal of Business Research	6	0.943	3	41	Academy of Management Learning and Education	0	2.889	3
13	Journal of Operations Management	5	2.42	4	42	Administrative Science Quarterly	0	2.853	4
14	Information Systems Research	5	2.261	4	43	Organisational Behaviour and Human Decisions	0	2.74	4
15	Academy of Management Journal	4	6.079	4	44	Journal of Organisational Behaviour	0	2.441	4
16	International Journal of Management Reviews	4	1.714	3	45	Leadership Quarterly	0	2.205	4
17	European Journal of Marketing	4	0.712	3	46	International Journal of Management Science	0	2.175	3
18	Information & Management	3	2.358	3	47	Group and Organisation Management	0	2	3
19	MIS Quarterly	2	3.541	4	48	Advances in Strategic Management	0	1.838	3
20	Research Policy	2	2.655	4	49	Harvard Business Review	0	1.793	3
21	Management Science	2	2.354	4	50	International Small Business Journal	0	1.729	3
22	Decision Sciences	2	2.318	3	51	International Journal of Forecasting	0	1.685	3
23	Journal of Information Technology	2	1.966	3	52	Systems Dynamics Review	0	1.415	2
24	Organisation Studies	2	1.857	4	53	Journal of Occupational and Organisational Psychology	0	1.361	4
25	Supply Chain Management	2	1.417	3	54	Tourism Management	0	1.274	3
26	IEEE transactions on Engineering Management	2	1.156	3	55	Manufacturing & Service Operations Management	0	1.214	2
27	Academy of Management Perspectives	2	1.118	3	56	Journal of Economics and Management Strategy	0	1.164	3
28	Californian Management Review	2	1.109	3	57	Sloan Management Review	0	1.1	3
29	Journal of Small Business Management	2	0.875	3					

Table 2.2 – Literature Review Findings

Several techniques were tested for recording and supporting the analysis of the literature content including paper based (highlighter pen), word document summaries, NVIVO8 and Microsoft Access as illustrated in table 2.3. After trialling each technique, the author opted to use programming and database skills to construct a bespoke literature review and coding system, structured as indicated in appendix 2.1. The platform used was Microsoft Access, a robust and proven software programme with a wide range of graphical tools for data synthesis and analysis.

Approach	Accurate record	Ease to Store/ Retrieve Data	Search-ability of Data	Ability to Build Relationships	Researcher Skill Level in Creating Bespoke Outputs
Highlighter	✓	x	x	x	n/a
MS Word	✓	✓	x	x	✓
NVivo8	✓	✓	✓	✓	x
MS Access	✓	✓	✓	✓	✓

Table 2.3 – Summary of Options for Literature Review Data Management

A software based approach was favoured over a manual approach in line with the views of Weitzman (2000, p807) that “software can map data relationships and help draw out inferences” with the inherent advantage that “data can be collated in the one place - providing an immensely powerful cataloguing tool to support analysis”. Maxwell (2005, p6) proposes that “researcher skills and preferred style” should have a significant bearing on the selection of methods and practical choices should be made accordingly. With ten years experience in visual basic programming and working with different versions of MS Access, its selection over the alternatives as a knowledge management system for the literature review fitted best with the researcher’s existing skills.

The database tool supported the author in efficiently capturing the contents of the papers suggested in the review, tagging the emergent findings with meta-data, and ultimately conducting deep analysis of the field of dynamic capabilities. As a result,

the field can be comprehensively characterised, basic and advanced concepts associated with the central construct can be explicated and common themes and views can be identified, including potential contributions to knowledge based on a parsimonious conceptual framework.

Review of the Field of Dynamic Capabilities

This section reviews the development of the field of dynamic capabilities based on analysis of the meta-data from the 183 papers returned by the structured literature review. The context of the field is described in order to inform and illuminate the process of making conceptual choices throughout the remainder of the thesis. Identifying trends in dynamic capabilities publications is also intended to aid the justification of contributions to literature argued later in the thesis. Both these intended outcomes are in alignment with the use of a structured literature review as a means to avoid a narrow, limited account of the field.

Two main sets of meta-data are considered. Firstly, the relative emphasis of theoretical and empirical contributions over the past 20 years is reviewed to explain how the field has developed. Based on the current status of available literature, this information is used to draw inferences about where a likely contribution to dynamic capabilities literature can be made. Secondly, the geographical distribution and emphasise of authors is presented to provide contextual information which will inform the clarification of concepts, development of a conceptual framework and design of an appropriate research methodology.

Relative Emphasis of Theoretical and Empirical Contributions

Diagram 2.1 illustrates the evolution of dynamic capabilities literature in the last 20 years as uncovered in the literature review³. This diagram was prepared by classifying each contributing paper according to its primary emphasis and is only coded once (e.g. a paper with a theoretical preamble to set hypotheses which are then tested through statistical analysis of secondary data would be classified as a

³ For the remainder of this chapter, where reference is made to dynamic capabilities literature, the author is referring to the articles uncovered by the structured literature review

quantitative paper) As might be expected, initial contributions were theoretical as authors sought to explicate fundamental concepts and set the boundaries of the field.

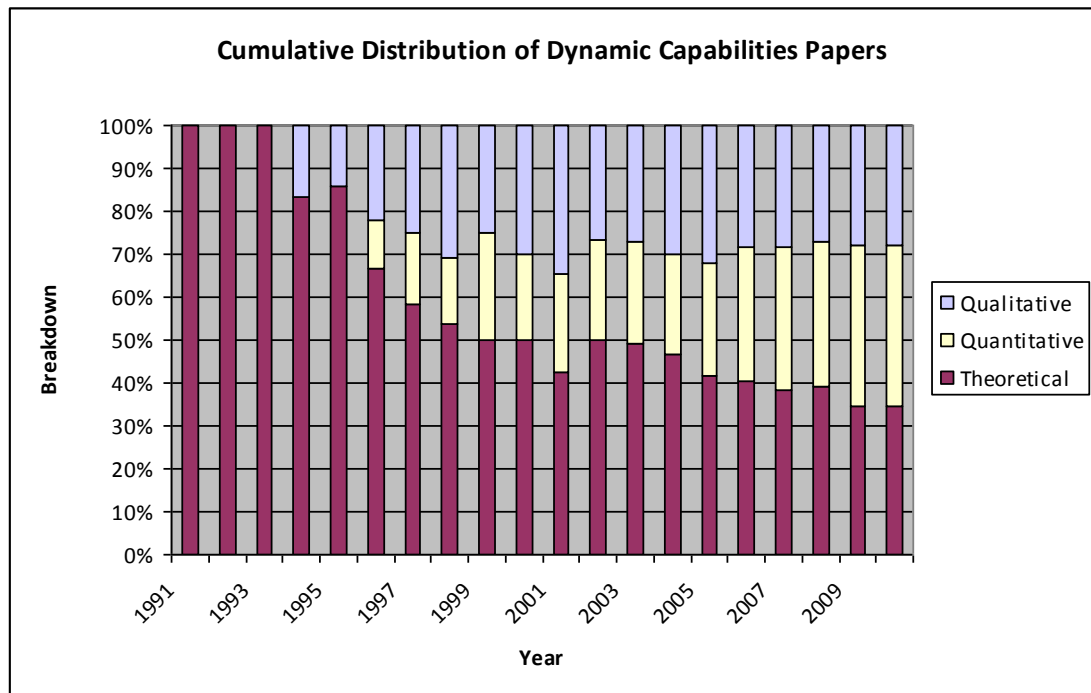


Diagram 2.1 –Publication Types in the Field of Dynamic Capabilities

Over the following decade, empirical contributions started to emerge, initially in the form of qualitative case study papers and then subsequently quantitative contributions from both primary and secondary data sources. Between 1999 and 2004, available literature was approximately evenly divided between theoretical and empirical offerings. However, in the last five years, empirical papers have become available at a faster rate than theoretical papers and the field is now characterised by a 35:65 theoretical/empirical split of papers.

This overview, based on a structured review of highly ranked papers, debunks unsubstantiated claims such as “most dynamic capabilities research focuses solely on conceptual discussions and empirical studies are rare” (Wu, 2010, p27). As is evidenced in diagram 2.1, there is more dynamic capabilities literature with an empirical grounding than a purely conceptual basis. This suggests that it is not reasonable to claim a contribution to dynamic capabilities literature solely on the basis of conducting an empirical study.

Instead, this macro-view confirms the value of in-depth qualitative studies to the development of dynamic capabilities literature. In the context of practice oriented research agendas requiring rich, contextualised qualitative data such as those proposed by Ambrosini and Bowman(2009) and Regnér (2008), the macro view highlighted in diagram 2.1 shows that the field is trending away from such work. Accordingly, the importance of any contributions which re-dress the balance is suggested.

Geographical Analysis of Author Contributions

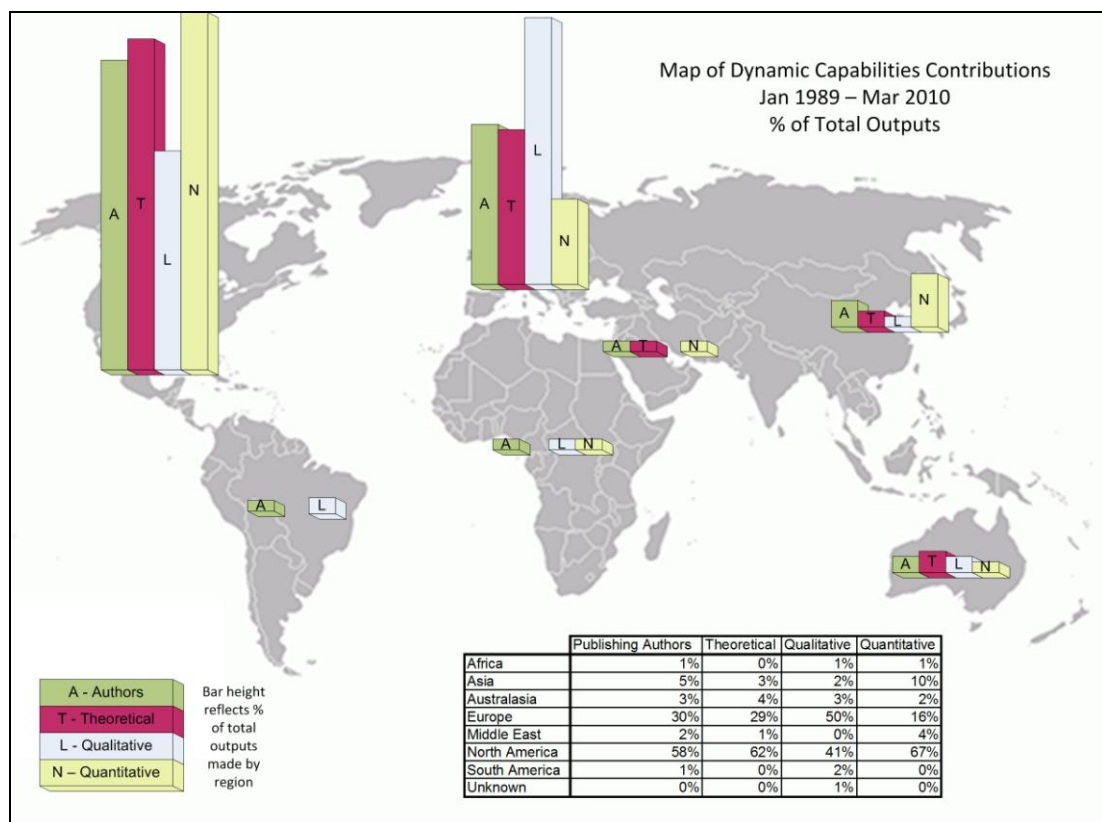


Diagram 2.2 – Geographical Map of Contributing Authors

A further meta-perspective is offered based on the location of contributing authors of dynamic capabilities journal papers. Given that research is a social activity (Sayer, 1992, 2000), authors are likely to be influenced by the academic communities in which they are resident. Kuhn (1996, p10) describes a paradigm as the total accepted practice of a research community including “law, theory, application and

instrumentation together” and Easton (2000, p205) comments that we can be “so embedded in our own paradigms that we take for granted that the methodologies we employ are correct because we are doing what everyone else does.” Related to a field such as dynamic capabilities which is still in a malleable developmental phase (Barreto, 2010), a disproportionate contribution by any group of authors might impose the accepted paradigm of a particular research community on the field based on tradition rather than need. For this thesis, understanding by whom and how contributions to date have been made can aid critical assessment where conceptual choices are to be made. Should an imbalance in the field exist, such data can also augment the justification of the value in alternative approaches.

Diagram 2.2 shows a distribution of the geographical location of the authors making contributions (as indicated on each journal paper⁴). At the top level, North American based authors made over half the contributions to dynamic capabilities literature, with nearly a third being made by European based authors. At the next level down, 62% of the contributing authors to theoretical/conceptual papers and 67% of contributing authors to quantitative papers were based in North American institutions. However, 50% of contributors to qualitative papers were based at European institutions.

This geographically oriented macro-view is argued to be of relevance to this thesis for two main reasons. Firstly, dynamic capabilities literature is considered to be part of the strategic management field. As argued by authors such as Mahoney (1995), Rindova and Kotha (2001), Zott (2003), George (2005), Jarzabkowski, (2005), López (2005), Helfat et al (2007), Witcher et al (2007), Augier and Teece, (2008) and Easterby-Smith et al (2009), content and process approaches to strategy research in a modern competitive global business environment have to go hand in hand. Therefore, it is important to produce a rounded and balanced review of literature, in light of the preferences and local influences of authors, drawing from a variety of backgrounds and research traditions when critically reviewing the field. Accordingly, this thesis

⁴ Where more than one author made a contribution to a paper, an entry of equal value is recorded for each author. For the 183 papers in the review, 358 author contributions were identified

should draw on content and process literature across a range of authors during discussion, even if it is focussing predominately on practice outcomes.

Secondly, Bruni and Verona (2009, p114) observe that “the paradox of most works on the dynamic-resource-based theory of the firm is that, despite their attention to organizational dynamics, they tend to contribute more to the ‘content’ side of strategy than the process side”. Levinthal’s (1995, p22) view that “traditional economic tools which form the basis of much content research do not readily lend themselves to an understanding of how distinctive resource positions in firms emerge - they also do not handle shifts in environmental conditions well”, shared by authors such as Nelson (1991), Mathews (2003, 2010), and Verona and Ravasi (2003) therefore raises a real concern. Augier and Teece (2009, p410) refer to dynamic capabilities as “an emerging paradigm” of research – if the dominant group of authors publishing on dynamic capabilities favour quantitative methods for paradigmatic reasons, how valid are these outputs if their instrumentation does not align with the evolving needs of the subject matter?

In understanding the ‘practical adequacy’ of extant empirical dynamic capabilities research, the appropriateness of quantitative tools is a key consideration and will be addressed more fully in chapter 7. In particular, the practical requirements of researching dynamic capabilities process and practice can be argued to suggest the presence of ‘core rigidities’ (Leonard-Barton, 1992) from quantitatively-oriented academic researchers⁵ deploying economic tools to micro-organisational research. However, for the more immediate aims of clarifying theoretical underpinnings and developing a conceptual framework, diagram 2.2 raises awareness of the potentially flawed deployment of quantitative techniques. Therefore, this macro view of the institutional influences acting on authors suggests hyper-vigilance of methodological

⁵ Taken in the wrong context, this comment could be viewed as a slight at many esteemed contributors to dynamic capabilities literature. That is not the intention of the author and once further theoretical and empirical groundwork has been developed in this thesis, this point will be examined in depth in the discussion chapter to explicate a grounded rationale for rejecting exclusively quantitative methods in the design and conduct of dynamic capabilities process research

limitations is required when reviewing findings relating to dynamic capabilities “process”, particularly in light of the trends suggested in diagram 2.1 that quantitative empirical papers are increasing in popularity in dynamic capability publications.

Review of the Field of Dynamic Capabilities

In summary, the use of meta-data analysis is intended to set the review of dynamic capabilities literature against a backdrop of high level trends and influences in the field grounded in data rather than gut feel. This may represent an innovative extension to the structured literature review process and therefore a potential contribution to methodological theory. The potential value of the approach will be developed through further discussion in chapter 7.

The meta-analysis is argued to have shown that dynamic capabilities, as a field of academic interest, is increasingly dominated by quantitative empirical research despite strong calls for qualitative, longitudinal field work to explore the detail of ‘how’ dynamic capabilities are developed and deployed. Such calls suggest that a potential contribution may be made through qualitative investigation of the micro-processes and daily activities which underpin dynamic capabilities. The remainder of this chapter is dedicated to presenting the general findings of the structured review capabilities literature in order to characterise dynamic capabilities from literature.

Review of Theoretical Contributions in Dynamic Capabilities Literature

The aim of this section is to shape the findings of the structured literature review into a conceptual map. This map is intended to make clear the definitions and conceptual characteristics of dynamic capabilities underpinning argumentation for the remainder of the thesis. Such an output is also intended to demonstrate the potential for Helfat et al’s (2007) definition of dynamic capabilities to unify much of dynamic capabilities literature. In achieving these aims, this chapter 2 thus addresses a number of criticisms levelled at the field (as explained later in this chapter).

The origin of dynamic capabilities literature is first discussed to show how the field has emerged from but is crucially different to the resource based view of strategy.

Next, a series of questions are posed – What are dynamic capabilities and what do they do? How do dynamic capabilities work? What impact do they have on competitive performance? What challenges and issues can be involved in using dynamic capabilities? These questions are used to structure a synthesis of the findings of the structured literature review. The chapter concludes with a visual representation of the general findings as a lead into the development of a more parsimonious conceptual framework.

Dynamic Capabilities Origins

Dynamic capabilities is closely associated with the resource based view of strategy and authors such as Teece et al (1997), Bowman and Ambrosini (2003), Mathews (2003), Easterby-Smith and Prieto (2008), Oliver and Holzinger (2008), Ambrosini and Bowman (2009) and Easterby-Smith et al (2009) choose to express the view that dynamic capabilities has evolved from the resource based view.

Underpinning Definition – What are Resources?

In explaining the origins of dynamic capabilities in the resource based view, it is useful to clarify the interpretation of the term ‘resource’. Helfat and Peteraf (2003, p999) offer the definition that, “A resource refers to an asset or input to production (tangible or intangible) that an organisation owns, controls or has access to on a semi-permanent basis”, a definition which integrates and agrees with the work of Amit and Schoemaker, (1993) and Grant (2008). Importantly, a firm need not own a resource to be able to use it (Helfat et al, 2007) and Teece and Pisano (1994) suggest that firms increasingly have to access external resources, through network activity, in order to survive and grow. Relatedly, Helfat et al (2007) suggest that the phrase ‘**resource base**’, instead of resources, should be used when describing all available assets or inputs to production in order to emphasise that the resources available to a firm do not necessarily lie within its traditional boundaries. In effect, a firm’s resource base refers to its total stock of inputs to production upon which it can draw to meet its goals.

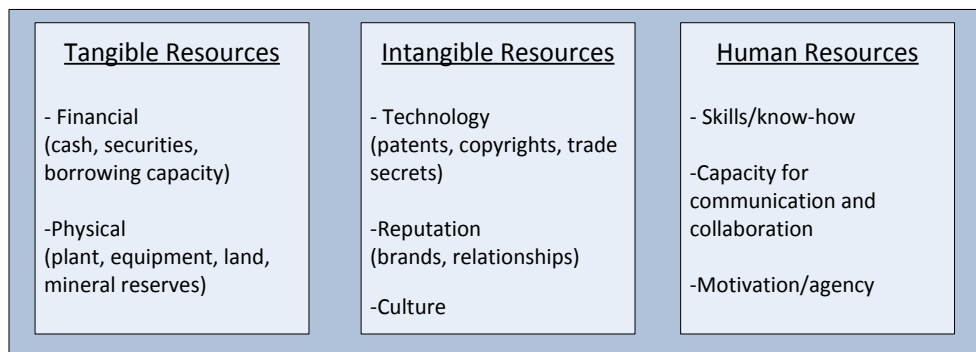


Diagram 2.3 – Resource Typology adapted from Grant (2008, p131)

Further authors such as Barney (1991), Grant (1991) and Doz (1997) classify resources according to type. Helfat et al (2007, p122) propose that a resource is “a tangible, intangible or human asset upon which an organisation can draw” and Grant (2008, p131) offers an integrative classification based on this ontological clustering, as represented in diagram 2.3.

According to Grant, (2008), **tangible resources** refer to the financial and physical assets of the organisation (they are the easiest type of resource to identify and measure); **Intangible resources** are those assets in which value is determined by perception and are therefore difficult to assess and measure and **Human resources** encapsulate the productive value associated with the traits of the organisational workforce (again, these are difficult to assess and measure). Grant (2008) further notes that human resources are different to other types of resource in that the organisation will never own them – humans can only be engaged with under the terms of a contract.

Dynamic Capabilities and the Resource Based View

The resource based view (RBV) is founded on the premise that if the firm is conceptualised as bundles of tangible, intangible and human resources then those bundles which are valuable, rare, inimitable and non-substitutable (VRIN) could represent a source of sustained competitive advantage (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993). RBV holds that when VRIN resources are operationalised, they provide firms with efficiency gains in the provision of value to customers and thus

allow firms to appropriate a greater proportion of rents (Peteraf, 1993; Peteraf and Barney, 2003).

In considering the inherent usefulness of resources, many authors use Barney's (1991) resource based VRIN framework to assess the stocks available to a firm. For example, Teece et al (1997) and Bowman and Ambrosini (2003) suggest that resources can be classified according to those that meet VRIN criteria and are therefore strategic, and the undifferentiated generic inputs to production which can and should be treated as commodities.

In theory, the sustenance of competitive advantage is facilitated primarily by the intangible aspects of the resource base. Intangible resources, such as organisational culture and reputation, cannot be traded freely in markets and therefore cannot be easily accumulated by competitors. As a result, any advantages attributed to leveraging bundles containing valuable intangible components have the potential to be long lasting (Barney, 1986; Dierickx et al, 1989; Barney, 1991; Peteraf, 1993; Cool et al, 2002).

The resource based view of strategy came to the fore of academic consideration in response to shortcomings in the dominant market position view of strategy, as exemplified by the work of Porter (1980, 1984), which explained relative firm performance in terms of industry level market positioning differences. However, the resource based view is also subject to a number of criticisms. From a position of logical positivism, Priem and Butler (2001) raised concerns about the analytic nature of RBV theorising i.e. that it rests on statements that are not theoretically contestable or falsifiable. Williamson (1999) also expresses a view that RBV theory is useful only for ex-post rationalisation of competitive outcomes and as such of little predictive value to management practitioners. In general, RBV is widely considered to be a "static" theory (Wernerfelt, 1995; Priem and Butler, 2001; Wang and Ahmed, 2007) which can provide a useful perspective on phenomena but which, as a standalone theory, has limited explanatory power.

Furthermore, many authors suggest that RBV logic breaks down in high velocity markets and that dynamic capabilities theorising is required to explain firm competitiveness in such environments – as such, it is suggested that a dynamic capabilities perspective can be used to address criticisms of the static nature of RBV theorising (Eisenhardt and Martin, 2000; Helfat and Peteraf, 2003; Wang and Ahmed, 2007 and Easterby-Smith et al, 2009)

A Dynamic capabilities perspective is also argued to better integrate considerations of the external business environment in understanding the value of resources and how they should be deployed (Aragon-Correa and Sharma, 2003, Mathews, 2003, Lillis and Lane, 2007). Teece (2006) suggests that the business ecosystem is described by the dynamic capabilities framework, encompassing internal and external factors and relationships. As such, he suggests it is a significant improvement on the five forces framework in both comprehensiveness and usefulness.

Dynamic capabilities and RBV vary in their logics – RBV residing in the logic of leverage whilst DCV focusing on the logic of opportunity – generating Ricardian and Schumpeterian rents respectively (Makadok, 2001).

In brief, dynamic capabilities theory shares much common ground with the RBV in an internal focus on the purposeful use of resources (López, 2005). However, the mechanisms, logic and perspective of the two approaches have crucial differences which may make dynamic capabilities more appropriate as a theoretical perspective for making sense of organisational survival and growth in the turbulent 21st century business environment. The relationship between dynamic capabilities and resource based views will be further explored in chapter 7.

The origins of a dynamic capabilities perspective as a resource oriented topic have been highlighted, but what exactly are they and what effects do they have? The following section addresses these questions with a view to making clear the conceptual bedrock upon which the remainder of this thesis is built.

What are Dynamic Capabilities and What Do They Do?

Tools for Changing Resource Configurations

According to Eisenhardt and Martin (2000, p111), dynamic capabilities “are best conceptualised as tools that manipulate resource configurations”, describing the antecedent mechanisms by which managers alter their resource base. These authors explain that dynamic capabilities allow the firm to add, develop, combine, redeploy and dispose of firm resources, aligning with Winter’s (2003) view that, principally, dynamic capabilities are concerned with change.

Capacity to Adapt to or Create Environmental Change

Many authors hold the view that dynamic capabilities describe the ability of firms to adapt their skills and resources to the environment; representing the ability of the firm to move with the times in line with the constraints set by its history and available resources (Teece and Pisano, 1994; Teece et al, 1997; Wheeler, 2002; Sambamurthy et al, 2003; Easterby-Smith and Prieto, 2008; O'Connor, 2008; Oliver and Holzinger, 2008; Ambrosini and Bowman, 2009; Barreto, 2010). A further widely expressed view is that dynamic capabilities also can represent the capacity of a firm to create market change, rooted in the ability of its managers to sense and seize commercial opportunities and appropriately reconfigure resources (Wheeler, 2002; Teece, 2007; Ng, 2007; Oliver and Holzinger, 2008; Augier and Teece, 2009; Newey and Zahra, 2009; Pandza and Thorpe, 2009).

Unifying definition

In terms of consistency though, a main criticism of the field of dynamic capabilities is that it lacks conceptual clarity. Whilst dynamic capabilities is described as a topic of increasing interest to academics and practitioners (Easterby-Smith et al, 2009), many authors hold the view that dynamic capabilities literature is characterised by confused terminology, inconsistency, overlapping definitions and outright contradictions (Winter, 2003; Zahra et al, 2006; Schreyögg and Kliesch-Eberl, 2007; Wang and Ahmed, 2007; O'Reilly III and Tushman, 2008; Easterby-Smith et al, 2009; Barreto, 2010). This appears to be a genuine concern - by way of illustration appendix 2.2 lists a sample of the definitions of dynamic capabilities suggested by

authors in the past 20 years. In response to the warning that the field will not be able to advance without at least a small amount of unification (Zahra et al, 2006), a number of eminent contributing authors in the field proposed the definition :-

A dynamic capability is the capacity of an organisation to purposefully create, extend or modify its resource base

p4 (Helfat et al, 2007)

According to Easterby-Smith et al (2009, pS3), this definition “is precise enough to be meaningful yet broad enough to allow scholars to learn more about the nature and origins of dynamic capabilities through investigation” and “it specifies that regardless of any ultimate effect, the action of dynamic capabilities is foremost upon the firm's resource base, including both tangible and intangible assets and capabilities.”

Helfat et al's (2007) definition is adopted as the initial point of departure for analysis of dynamic capabilities in this thesis and there are several arguments for doing so. Firstly, the definition offered addresses criticisms that dynamic capabilities theorising is tautological (in relation to firm performance and dynamic capabilities) (Prieto and Easterby-Smith 2006). In this Helfatian view⁶, dynamic capabilities imply an ability to intentionally make a change to the resource base of the firm. This ability can be directly measured in terms of outcome and importantly, there is no guarantee of outcome effectiveness or related firm performance promised.

Secondly, the definition is capable of encapsulating further key theoretical perspectives. Schreyögg and Kliesch-Eberl, (2007) suggest that dynamic capabilities literature as a field is confounded by three different fundamental theoretical views competing for attention; a radical dynamisation approach (as suggested by Eisenhardt and Martin (2000)); an integrative approach (as developed by Teece et al (1997)) and an innovation routine approach (championed by Winter (2003) and based on (Nelson and Winter, 1982, Nelson, 1991). Whilst differing in their views

⁶ The term Helfatian will be used forthwith to refer to the definition of dynamic capabilities as the capacity of an organisation to purposefully create, extend or modify its resource base

of dynamic capabilities, all these perspectives can all be aligned with the Helfatian definition. Therefore, it has the potential to serve as a platform for unifying much of extant literature.

Thirdly, the definition sets down some clear conceptual markers for distinguishing dynamic capabilities from general managerial activities. Under this definition, a dynamic capability must be deployed to effect an intended strategic resource base change; the notion of capacity implies that this must be achieved to a threshold level and the term resource base makes plain that it is the set of resources available to the firm on a preferential basis rather than the boundaries of the firm that define the objects of dynamic capabilities efforts. It is important that dynamic capabilities research is able to offer conceptual clarity as the field is coming under increasing scrutiny as it seeks to progress and develop (O'Connor, 2008; Barreto, 2010).

A Helfatian definition therefore serves as a platform for explaining further aspects of the character of dynamic capabilities and crystallising conceptual choices to be used in the remainder of this thesis.

Dynamic Capabilities Change Ordinary Capabilities

According to Winter (2003, p991), ordinary or operational capabilities are those that permit the firm to make a living in the short term and “dynamic capabilities exist to extend, modify or create ordinary capabilities”, a view shared by authors such as (Zollo and Winter, 2002, Zahra and George, 2002a, Helfat and Peteraf, 2003, Cepeda and Vera, 2007, Regnér, 2008, Easterby-Smith and Prieto, 2008, Cetindamar et al, 2009, Newey and Zahra, 2009).

Winter (2003) emphasises that dynamic capabilities are not always required to effect change to operational capabilities; such change can also happen by ‘ad hoc’ (one-off) approaches or even luck/serendipity (Bowman and Ambrosini, 2003). Zahra et al (2006) share the general idea but argue that improvisation becomes a decreasingly likely option for firms as they age.

This is a key consideration in researching dynamic capabilities – a change in an operational capability does not necessarily imply the deployment of a dynamic capability and any claim without evidence may represent tautological reasoning (George, 2005). This is not to suggest that retrospective analysis of changes to operational capabilities is not useful however - Helfat (2000) proposes that there is real value in developing retrospective analysis of past successes in order to better foundations for advice for the future. As Augier and Teece (2008), Ambrosini and Bowman (2009) and Easterby-Smith et al (2009) argue, dynamic capabilities represent the purposeful adaption of the resource base – if intentionality can be adequately established then retrospective analysis can be valid (Narayanan et al, 2009).

Underpinning Definition – What are Capabilities?

As noted earlier in this chapter (p16), capabilities can be defined and described in different ways. When suggesting that dynamic capabilities change ordinary capabilities, it is therefore important to clarify what precisely is meant by the term ‘capability’.

Sharing the views of Makadok (2001); Zahra et al (2006), Schreyögg and Kliesch-Eberl (2007) and Grant (2008), capabilities are taken to represent the set of things an entity can do. Capabilities might be expressed as the capacity for a combination of resources to perform some task or activity through complex co-ordination over time. At an organisational level, capabilities describe what the firm can do, representing a firm’s capacity to deploy resources to a particular end (Grant, 1991; Amit and Schoemaker, 1993; Barney, 2002; Helfat and Peteraf, 2003; Johnson et al, 2005; Helfat et al, 2007; Grant 2008; O’Reilly III and Tushman, 2008).

Amit and Schoemaker (1993, p35) observe that “capabilities are often developed in functional areas by combining physical, human and technological resources at a corporate level.” In addition to capabilities being developed in different functions, capabilities are proposed to exist at different levels of organizational activity, for instance at departmental, divisional, or corporate level (Schreyögg and Kliesch-

Eberl, 2007), and should be considered in terms of a hierarchy (Nelson, 1991; Collis, 1994; Teece and Pisano, 1994; Teece et al, 1997).

Grant (2008, p138) proposes a visual representation of a **hierarchy of capabilities** as depicted in diagram 2.4. At the bottom of the hierarchy is the “know how” resource of individuals associated with the organisation. This “know how” imbues individuals with a capacity to carry out particular tasks, which may also be referred to as single task capabilities. These single task capabilities can be combined to create the first level of meta-capability – the specialised capability. Such compound capability can potentially (although not necessarily) draw in the abilities of multiple individuals. The higher up the hierarchy, the greater the complexity of capability and the collective effort required to deliver its effects - “capabilities emerge from the interaction between multiple agents and exist in a sense independent of individual agents” (Foss and Eriksen, 1995, p46). Schreyögg and Kliesch-Eberl, (2007) further suggest that capabilities are collective, socially embedded activities reflecting resource allocation abilities and emerge incrementally from daily interactions, a view shared by Pandza et al (2003a).

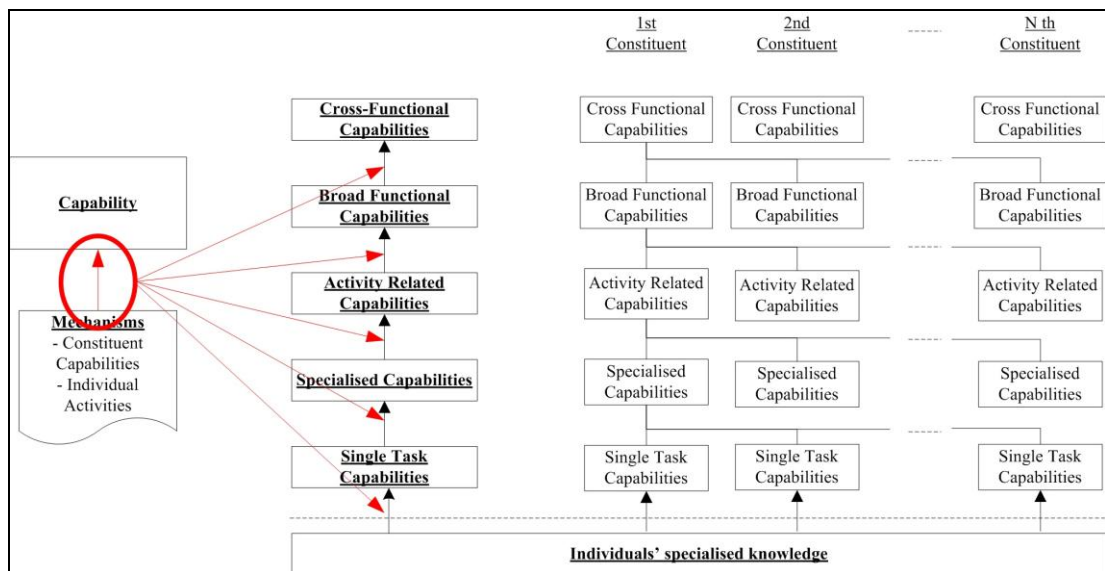


Diagram 2.4 – Hierarchy of Capabilities adapted from Grant (2008, p138)

Based on a hierarchal, nested view of capabilities, Winter (2003, p992) argues that organisational capabilities are “**complex, structured and multi-dimensional**”, a

view shared by Amit and Schoemaker (1993), Collis (1994), Schreyögg and Kliesch-Eberl (2007), Teece (2007), Wang and Ahmed(2007), Ambrosini et al(2009) and Dixon et al (2010). Winter (2003) also ascribes these characteristics to dynamic capabilities, which he views as a sub-set of organisational capabilities.

Dynamic Capabilities are Meta-Capabilities

Eisenhardt and Martin (2000) and Teece (2007) argue that dynamic capabilities are meta-constructs. The concept of organisational dynamic capabilities as **meta-capabilities** is consistent with the idea of a hierarchy or order of capabilities - Eisenhardt and Martin (2000, p1116) suggest that “dynamic capabilities are often combinations of simpler capabilities and related routines, some of which may be foundational to others and so must be learned first.”

Related to the notion of dynamic capabilities as a complex, multi-dimensional construct, Ambrosini et al (2009) propose a **stratified typology** of dynamic capabilities for adapting other organisational capabilities – incremental dynamic capabilities deliver continuous improvement style change; renewing dynamic capabilities alter the utility of resource stock in a discontinuous way; regenerative dynamic capabilities alter extant dynamic capabilities.

In the context of this thesis, there are implications for research design. If dynamic capabilities can be considered at different levels, what should be the unit of analysis and how can and do different existential levels interact? These questions are addressed at the start of chapter 3, prior to developing the conceptual framework.

In answer to “What are dynamic capabilities and what do they do?”, the views expressed above suggest that dynamic capabilities are multi-dimensional constructs which provide a capacity to purposefully create, extend or modify the resource base of organisation. Further questions are raised though as to how they might do so – this matter is addressed in the following section.

How do Dynamic Capabilities Work?

Managers are Central to Dynamic Capabilities

A widely held view is that managers and what they do are central to the deployment of the dynamic capabilities construct. Authors such as Mahoney (1995), Teece et al (1997), Eisenhardt and Martin (2000), Helfat et al (2007), Teece (2007), Augier and Teece (2008) and Ambrosini et al (2009) identify the critical role managers play as proponents of dynamic capabilities through the provision of resource deployment, coordination and orchestration decisions and actions. Helfat and Peteraf (2003) offer the concept of capability lifecycles – analogous to product life cycles – to describe how managers⁷ elect to develop, exploit, reapply, run down or kill off mature capabilities.

The previous section suggested that dynamic capabilities might exist at different levels within an organisation. At a managerial level, Helfat et al (2007, p24) build on earlier work by Adner and Helfat (2003) in defining dynamic managerial capabilities, stating that:-

A dynamic managerial capability is the capacity of managers to purposefully create, extend or modify the resource base of an organisation

Exploring the concept of dynamic managerial capabilities, Adner and Helfat (2003), Helfat et al (2007), Bruni and Verona (2009), Eggers and Kaplan (2009) and Sirmon and Hitt (2010) suggest that the resource management and asset orchestration abilities of managers are rooted in their individual characteristics of human capital (inc. experience), social capital and cognition/mental models. In terms of the general hierarchy of capabilities depicted in diagram 2.4 (p35), this view would imply that

⁷ Zahra et al (2006, p952) note that managers should be considered - “all those empowered to conceive or implement changes to the core substantive capabilities of the firm. In small or new firms this set probably includes but a relatively small number of top managers; in larger firms this set includes not only ‘top’ managers but the set of middle managers key in strategy implementation and formation”

dynamic managerial capabilities may be considered the elementary building blocks of organisational dynamic capabilities.

Adner and Helfat (2003, pp1012-3) state that dynamic managerial capabilities, “are a direct analogy to the more general organisational dynamic capabilities” and that “an answer to the question of what makes firms different requires an answer to the question of what makes managers different”. In terms of implications for this thesis, the concept of dynamic managerial capabilities is identified as offering an appropriate level of analysis for a research design aiming to address the research aims identified in chapter 1. Furthermore, there appears to be a suggestion that investigating dynamic managerial capabilities will also yield insights into how ‘meta’ organisational level dynamic capabilities operate. These ideas will be developed further at the start of chapter 3 in advance of developing the conceptual framework.

Dynamic Capabilities Are Grounded in Processes

A common theme emerging from the contributions reviewed is that dynamic capabilities in operation may be represented by **processes** (Eisenhardt and Martin 2000; Wang and Ahmad, 2007; Ambrosini and Bowman, 2009; Easterby-Smith et al, 2009). Teece et al (1997) suggest that dynamic capabilities should be thought of as coordinative management processes with a strong grounding in organisational learning. Eisenhardt and Martin (2000) propose that dynamic capabilities are a set of specific and identifiable processes by which the firm manages its resources. According to Bowman and Ambrosini (2003) and Ambrosini et al (2009), dynamic capabilities are organisational processes which may have become embedded in the firm over time, employed to reconfigure the firm’s resource base through constitutive processes of reconfiguration, leveraging, learning and integration.

Underpinning Definitions – What Are Processes and Routines?

But what are processes? Benner and Tushman (2003, p240) suggest that “processes are collections of activities that, taken together, produce outputs for customers”, a definition supported by the views of Teece et al (1997), Wang and Ahmed, (2007) and Cetindamar et al (2009). Helfat et al’s (2007, p30) offer the perspective that,

“processes are mechanisms by which dynamic capabilities are put into use, and mechanisms by which organisations can develop dynamic capabilities”. Newey and Zahra (2009) add that given they achieve some form of output, processes may be considered as generative mechanisms. Teece et al (1997, p518) suggest that processes may describe, "the way things are done in the firm", incorporating "patterns of current practice and learning" in the form of routines.

According to Zollo and Winter (2002, p340), “Routines are stable patterns of behaviour that characterise organisational reactions to variegated, internal or external stimuli.” Winter (2003, p991) further comments that routines are “repetitious or quasi-repetitious and founded in part in tacit knowledge”. Costello (2000) suggests that the notion of routines is exemplified by the sort of activity conducted on a production line - where a task is repeated in a way which may be considered automatic but it is not necessarily explicit and may be complex.

In establishing the relationship between routines and processes, the view adopted in this thesis, as advocated by Pandza and Thorpe (2009), is that processes have a patterned element described by routines but can also incorporate emergent, agential activities such as managerial decision making. As an extension of this view, it is also accepted that where routine components are high, processes may resemble routines and equally in other circumstances the routine component of processes may not be obvious. On the basis that the premise that dynamic capabilities are enacted through processes is accepted, this view aligns with Eisenhardt and Martin’s (2000) perspective that the form of dynamic capabilities (in terms of the level of routine content) will vary with circumstances.

Synthesising these views, in general processes are taken to be **collections of patterned and unpatterned activities which do things in a firm** and specifically relating to dynamic capabilities, **processes are the collections of routine and non-routine activities by which dynamic capabilities are put into practice.**

Implications for this thesis may be directly inferred. Firstly, it appears that developing understanding of the deployment of dynamic capabilities will require examination of “collections of activities” which, over time, act as generative mechanisms. In addition, it is anticipated that these collections of activities may be composed of a contingent blend of routine and agential components in practice.

Furthermore, various authors suggest a range of processes which may represent dynamic capabilities. For example, Zahra and George (2002a,b) identify absorptive capacity as a dynamic capability operating through the processes of knowledge acquisition, assimilation, transformation and exploitation (in other words, the deployment of any of these processes represents a deployment of dynamic capabilities). Eisenhardt and Martin (2000) propose that product development, strategic decision making and alliancing processes are all dynamic capabilities; more generally, Bowman and Ambrosini (2003) nominate processes of resource reconfiguration, leverage, learning and integration as dynamic capabilities.

In adopting a Helfatian definition, this thesis aligns with a more general description of dynamic capabilities as coordinative management processes (Teece et al, 1997). It is argued that under the Helfatian definition, the intention of specific dynamic capabilities processes as identified above can be accommodated through under the more general consideration of the “creation, extension or modification” of the resource base. This enables empirical research to focus on how the processes are enacted (routine biased, non-routine biased, balanced) rather than the classification of the processes used (eg. as absorptive capacity, the product development process etc.). Understanding the impacts and implications of specific dynamic capabilities processes is arguably a useful exercise, but one that is beyond the scope of this practice oriented thesis.

Based on the idea that dynamic capabilities are grounded in processes as collections of routine and non-routine activities, further implications may be developed from the literature as described below.

Dynamic Capabilities Take Effect Over Time

On the basis that processes are deployed over time and that dynamic capabilities are grounded in processes, the view shared by Galunic and Eisenhardt (2001); Pandza et al (2003a,b) and Lazonic and Prencipe (2005) that dynamic capabilities take effect over time is accepted. This makes sense in light of Winter's (2003) view that dynamic capabilities change ordinary capabilities. According to Szulanski, (1996), Teece et al (1997) and Dixon et al (2010), extant capabilities grounded in routines and social components of a firm can be described as **sticky**. This term encapsulates the view that as firms often lack the free capacity to change complex combinations of resources which comprise capabilities, recognition of the need to change can precede the actual change of capabilities by a significant period of time. Furthermore, change of such capabilities may require tacit learning through experiential, trial and error approaches (Eisenhardt and Martin, 2000; Zollo and Winter, 2002; Pil and Cohen, 2006; Teece, 2007) as experiential learning theory indicates that "the acquisition and transformation experience is central to the learning process" (Kolb in Corbett, 2005).

As a result for studies such as this thesis which seek to develop understanding of how dynamic capabilities are used in practice, a longitudinal dimension would appear necessary to any research design employed.

Dynamic Capabilities' Mechanisms are subject to Opaque Influences

When the view of dynamic capabilities being grounded in collections of activities is considered in combination with the notion of a hierarchy of capabilities on a foundation of shared resources, a perspective emerges which suggests that dynamic capabilities may exert a synergistic effect on each other through **constituent process complementarities** (Teece and Pisano, 1994, Teece et al, 1997, Eisenhardt and Martin, 2000, Teece, 2007, Easterby-Smith et al, 2009). This can make dynamic capabilities hard to imitate but equally can make their origin, effect and even existence opaque to the firm which actually holds the dynamic capability (Ambrosini and Bowman, 2009, Easterby-Smith et al, 2009). Equally, it may be the case that understanding how dynamic capabilities operate is not simply a matter of summing a range of constituent parts.

The literature also suggests that processes may be shared with non-dynamic capabilities. Zahra et al (2006), Newey and Zahra (2009) and Mathews (2010) all argue that dynamic capabilities are preceded, in the life of an organisation, by substantive/ ordinary capabilities but that over time, a complex web of interconnections develop between the two construct through shared resources. Eventually, a paradoxical challenge of balancing exploitation of existing resources and exploitation of new resources will have to be addressed, requiring an **'ambidextrous'** approach (Benner and Tushman, 2003, Schreyögg and Kliesch-Eberl, 2007; Graetz and Smith, 2008; O'Reilly III and Tushman, 2008).

The implication for this thesis is that there may be value in attempting to shape a research design which can enable better understanding of the influences on dynamic capabilities in practice. It is also recognised that from a practical perspective, the intangible nature of complementarities suggests that any inter dynamic capability effects might be difficult to detect and understand. It may also be necessary to take heed of conflicting priorities within any organisations providing empirical data as tensions between exploitation and exploration demands are addressed.

Before synthesising views on the impact of dynamic capabilities on competitive performance, a view on the overlap and differences between the terms 'process' and 'capability' is offered below. This is considered useful to do as their effects have been similarly described above and there appears to be a degree of substitution of the terms in the extant literature.

Clarification of the Different Mechanisms of Processes and Capabilities

What is the relationship between capabilities and processes? O'Connor (2008, p316) proposes that capabilities "are the business processes needed to configure assets in an advantageous way" and Ambrosini and Bowman (2009, p34) state plainly that "capabilities are processes". Teece et al (1997, p529) suggest a slightly looser relationship in that "the capabilities approach places emphasis on the internal processes that a firm utilises as well as how they are deployed and how they will evolve." Teece and Pisano (1994) and Teece et al (1997) further propose that

dynamic capabilities may be understood in terms of developmental paths, resource positions and organisational processes.

More of a distinction may be drawn between capabilities and processes when their outcomes are considered. Easterby-Smith and Prieto (2008, p237) suggest that “a capability is the ability to do something, not the things that are done”, a view echoed by Easterby-Smith et al (2009). Zahra and George (2002a, b), Lavie (2006) , Fink and Markovich (2008) and Ambrosini and Bowman (2009) further develop this idea through exploration of “realised” and “potential” dimensions to different organisational capabilities.

Such views are consistent with a critical realist perspective of how real world social objects/structures (such as dynamic capabilities) and their associated generative mechanisms (such as their component capabilities) have actual effects. Diagram 2.5 shows a critical realist view of causation as espoused by Sayer (1981, 1992, 2000). The potential which a real world object has to actually do something is separate from that which it is able to do; its effects in actuality are mitigated by conditions provided by mechanisms of interacting alternative real world structures and objects.

Based on such a critical realist perspective, capabilities can be considered a useful construct for suggesting how resources could be used and processes can be considered a useful construct for understanding how they actually are used. Combined, they can give an understanding of the efficiency of deployment of resources which can help make decisions and plan for the future. For example, a production line may, by design, have a potential output of 100 units per minute. Observing the production process might reveal that wear and tear of equipment and lack of training of staff has resulted in an actual/realised output of 60 units per minute. Crudely comparing actual/potential reveals a 60% efficiency of deployment of resources – this information can inform decision making about the continued/future deployment of resources.

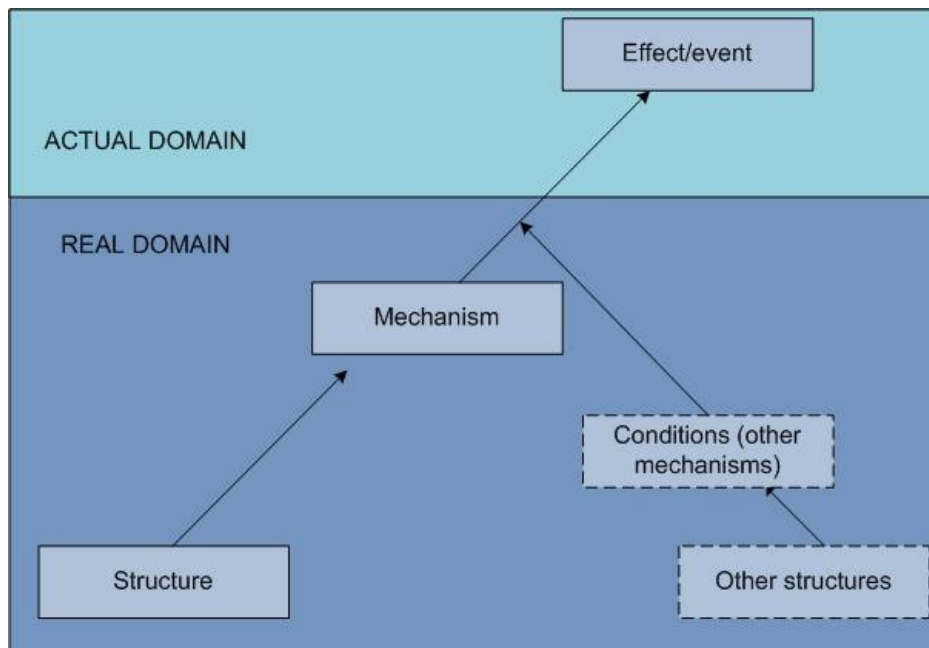


Diagram 2.5 – A Critical Realist View of Causation

Therefore, in this thesis, capabilities are defined as describing the potential capacity for deployment of resources towards achieving a given outcome; processes describe the realised deployment of resources towards a given outcome. This implies that any critical review of literature used to shape a conceptual framework should be able to accommodate the view that in practice, what actually happens may be a mitigated version of what could happen.

In chapter 1, suggestion was made of the potential value of dynamic capabilities as a means by which organisations might better perform in a turbulent environment. Extant views on the likely impact of dynamic capabilities are now considered.

What Impact do Dynamic Capabilities Have on Competitive Performance?

Dynamic Capabilities Contribute Only Indirectly to Competitive Advantage

Teece and Pisano (1994, p537) argue that “Competitive advantage of firms **stem** from dynamic capabilities rooted in high performance routines operating inside the firm, embedded in the firm's processes, and conditioned by its history”. This view is shared by authors such as Helfat and Peteraf (2003), Mahoney (1995), Eisenhardt and Martin (2000), Makadok (2001); Zott (2003), Schreyögg and Kliesch-Eberl

(2007); Teece (2007); Wang and Ahmed (2007) and O'Reilly III and Tushman (2008) who argue that dynamic capabilities create difficult to imitate organisational capabilities, resource combinations and intangible assets which can be a source of competitive advantage for a firm.

Imperfect factor markets for intangible resources mean that firms have to develop capabilities internally - many organisational capabilities, routines and socially complex assets cannot be traded on an open market - but this quality may imbue them with the potential for generating competitive advantage if they are rare and valuable (Amit and Schoemaker, 1993, Teece and Pisano, 1994, Teece et al, 1997, Aragon-Correa and Sharma, 2003, Augier and Teece, 2008, Augier and Teece, 2009). This view is partly challenged by Mathews (2003), who suggests networks and partnerships may allow the partial trading of socially complex resources.

Where firms engage in alliancing and networks, the appropriability regime of the output of dynamic capabilities determines how much they contribute to competitive advantage (and also who profits from them) (Amit and Schoemaker, 1993; Teece et al, 1997; Zahra and George, 2002a; Blyler and Coff, 2003; Möller and Svahn, 2006; Teece, 2006). This is an important consideration as firms may deploy dynamic capabilities to capture preferential access to external resources through external partnering arrangements such as alliances and joint ventures, acting as brokers or hubs in networks (Wheeler, 2002, Mathews, 2003, Macpherson et al, 2004, Lavie, 2006, Möller and Svahn, 2006,).

The separation of the activity of dynamic capabilities from direct competitive advantage and firm performance effects is a critical conceptual lever - dynamic capabilities must be considered a **necessary but insufficient condition** for competitive advantage (Eisenhardt and Martin, 2000, Wheeler, 2002, Zahra et al, 2006, Teece, 2007). By avoiding claims that dynamic capabilities are a source of competitive advantage, criticisms of tautological reasoning aimed at the logic of the resource based view can be avoided (Eisenhardt and Martin, 2000). This key

consideration is incorporated into the view that dynamic capabilities are the capacity to purposefully manage and modify the resource base.

Therefore, this thesis should not attempt to build a direct link between dynamic capabilities and firm performance. If any such link is to be addressed, it must be mediated by the impacts of any intentional changes made to the resource base.

Dynamic Capabilities are Grounded in the Logic of Opportunity

A commonly held view in dynamic capabilities literature is that competitive advantage is typically short term and the **logic of opportunity** should be adopted to create a series of temporary advantages for firms (Teece et al, 1997; Eisenhardt and Martin, 2000; Makadok, 2001; Sambamurthy et al, 2003; Siguaw et al, 2006). The dynamic capabilities view couches competition in Schumpeterian terms (Teece and Pisano, 1994; Mahoney, 1995; Teece et al, 1997; Makadok, 2001; Teece, 2007; Wang and Ahmed, 2007; Easterby-Smith and Prieto, 2008; Augier and Teece, 2008; Augier and Teece, 2009), where firms compete on the continuing ability to combine and recombine their resources in novel ways (products being a related output of such activities). Therefore dynamic capabilities can give the appearance of sustaining competitive advantage in complex and volatile environments (through maintaining a series of temporary advantages) – such advantage arises from the resource configurations that dynamic capabilities creates rather than the capabilities themselves (Zahra et al, 2006; Ambrosini and Bowman, 2009; Barreto, 2010). The definition of dynamic capabilities selected for this thesis encompasses this point by having at its heart the notion of resource base management – a critical ability for any firm subject to Schumpeterian competition. Post-empirical reflections on the logic of opportunity are offered in chapter 7.

Dynamic Capabilities can Create ‘Real Options’ for Managers

Strategy literature describing ‘real options’ for managers (itself a derivative of financial theory) crosses over to dynamic capabilities literature (Mathews, 2003; Barnett, 2005). Authors such as Pandza et al (2003a), Sambamurthy et al (2003), and Winter (2003) suggest that dynamic capabilities represent a hedge against future challenges to the relevance of firm capabilities in a particular competitive context,

effectively presenting the firm with a series of real options. Teece (2007) suggests that firms practicing small but frequent investments naturally develop strategic options whilst minimising the consequences of some inevitable failures (and thus maximising learning). O'Connor, (2008, p326) proposes that an options mentality can help an equilibrium seeking open system such as a firm entertain radical innovation and disruptive change by providing a “mechanism for constant reflection and reconfiguration”. Nelson (1991) suggests that an options approach is required as the world is far too complicated for any one firm to understand. According to Barnett (2005), real options approaches represent a perpetual but low key state of exploration, and require a high level of managerial attention to execute options when appropriate.

The notion of ‘real options’ as a managerial approach to developing resources could mean that deployments of dynamic capabilities might be underway at any one time in an organisation. In designing a research approach to examine dynamic capabilities deployment, it is therefore worthwhile considering how sequential and current deployments of dynamic capabilities might be described in terms of a real options approach – this matter is also discussed further in chapter7.

Dynamic capabilities appear to represent a valuable set of tools based on the details in this chapter so far. Conceptually, they seem to avoid many of the criticisms levelled at the RBV, they seem to allow managers to respond to or create market change and they can indirectly help an organisation build or sustain competitive advantage. There are, however, a number of issues associated with knowing and deploying dynamic capabilities, as described in the next section.

What challenges and issues can be involved in using dynamic capabilities?

Dynamic Capabilities are Dissipative

There is wide agreement that dynamic capabilities incur a **cost to develop and deploy** which might include cognitive, managerial or operational components (Teece et al, 1997; Winter, 2003, Lavie, 2006; Zahra et al, 2006; Ambrosini and Bowman, 2009; Barreto, 2010,). When firms are not using a dynamic capability, they must bear

the cost of maintaining it (e.g. a team of NPD engineers not involved in developing a new product)(Winter, 2003) and may as a result be cost ineffective in a stable environment which doesn't require change. Firms that neglect to maintain their dynamic capabilities risks having them atrophy (Zollo and Winter, 2002, Pandza and Thorpe, 2009). In particular, **the managerial resource of attention and energy has to be invested into dynamic capabilities** (Mahoney, 1995; Mathews, 2003, 2010; Lavie, 2006; Pablo et al, 2007; O'Reilly III and Tushman, 2008; Ambrosini and Bowman, 2009).

It would seem that in practice, dynamic capabilities consume organisational resource and versus the stated aims of this thesis, to build understanding of how they are used would seem to require developing insights into their dissipative nature – that is to say, to develop further insights into how managerial resource is consumed by dynamic capabilities.

Dynamic Capabilities can be Rendered Obsolete

Moreover, Winter (2003) and Schreyögg and Kliesch-Eberl (2007) argue that organisations carrying dynamic capabilities also carry a degree of risk as dynamic capabilities can rapidly be **rendered obsolete** by changes in the environment. Schreyögg and Kliesch-Eberl (2007, p916) refer to this vulnerability to environmental change as “the dark side of capabilities” as previously valuable assets can very quickly become liabilities (in line with the notion of core rigidities (Leonard-Barton, 1992)). This raises a point of inquiry – how do dynamic capabilities perform in response to environmental change? This matter will be redressed in the discussion of organisational dynamic capabilities in chapter 7 in light of the empirical findings of this thesis.

Dynamic Capabilities Operate in a Complex Environment

A key challenge for managers is to strike a balance between the costs of maintaining and deploying dynamic capabilities. Notions of **ambidexterity** are raised in the challenge of maintaining a balance between exploration and exploitation in a firm (Benner and Tushman, 2003; Graetz and Smith, 2008; Judge and Blocker, 2008; O'Reilly III and Tushman, 2008; Lichtenthaler and Lichtenthaler, 2009). Managerial

perception and judgement also shape which of the myriad competing priorities in the business will determine how and where dynamic capabilities will be deployed (Zahra et al, 2006). O'Connor (2008) suggests that knowledge relating to dynamic capabilities will be lost in high uncertainty environments when efforts will not be made to codify learning as managers perceive such activity to be wasted effort. These views emphasise the centrality of managers in the deployment of dynamic capabilities – they are constantly making choices about how dynamic capabilities should be used. Furthermore, depending on the general organisational context, managers have to manage a tension between demands for their scarce resources. These points suggest that any research design focussing on a managerial level of analysis should expect a range of organisational influences and tensions to impact ongoing how dynamic capabilities are deployed.

Dynamic Capabilities Depend to a Degree on the Perceptions of Fallible Humans

Further barriers to the development and deployment of dynamic capabilities exist. According to Teece et al (1997, p597) “**narcissistic organisations**” are unlikely to appropriately deploy dynamic capabilities as their managers lack the perspicacity of vision and humility required to identify the need to change – previously adequate firms can develop such rigidities over time as hubris and over-confidence in their own abilities slowly develop (Leonard-Barton, 1992; Rumelt, 1995; Zahra et al, 2006; Schreyögg and Kliesch-Eberl, 2007; Ambrosini et al, 2009; Ambrosini and Bowman, 2009).

Furthermore, Lavie (2006) and Teece (2007) argue that dynamic capabilities may be inhibited by established routines and **psychological reluctance** to write off sunk costs grounded in previous investments. Further effects highlighted are risk-averse bias, perceptual bias, investment decision errors, excessive optimism, strategic deception and program persistence – managers can be highly constrained by their current pool of resources and capabilities (Amit and Schoemaker, 1993; Mahoney, 1995; Helfat, 2000; Lavie, 2006; Schreyögg and Kliesch-Eberl 2007, Teece, 2007). Where cognitive and behavioural issues are too engrained, it may be necessary to replace the managers, as highlighted by Ambrosini et al (2009), using the example of

Marks and Spencer where a new chairperson was required to introduce transformative dynamic capabilities.

Where ambidextrous organisational forms are required to balance exploitation and exploration activities underpinning dynamic capabilities, an enhanced level of **managerial cognition** is required – extant managerial teams may not be up to the task (Benner and Tushman, 2003, O'Reilly III and Tushman, 2008). Equally, managerial mental models and cognitive abilities are argued to be critical to the creative activity of discontinuous change (Pandza and Thorpe, 2009).

Managerial perception and cognition appear to have a major impact on how dynamic capabilities are deployed. This places an emphasis on the agential components of the processes which might be drawn on by dynamic capabilities and suggests that dynamic capabilities might be incorrectly or irrationally used. In conducting an empirical investigation, understanding the impact of these factors will likely require qualitative data collection methods.

Dynamic Capabilities do NOT Guarantee Successful Outcomes

Many authors agree with the point stressed by Winter (2003) that dynamic capabilities do not guarantee a firm's success or survival – at an even more fundamental level dynamic capabilities can be deployed incorrectly, incompletely, at the wrong time or to the firm's disadvantage – potentially destroying valuable extant capabilities (Zahra et al, 2006; Ambrosini et al, 2009; Ambrosini and Bowman, 2009; Narayanan et al, 2009). Zott (2003) strongly implies that timing of resource base change is critical; Barnett (2005) notes the risk with real options approaches of missing the ideal time to take up options. Ambrosini et al (2009) argue that managerial perceptions of reality, rather than reality itself, determine how dynamic capabilities are deployed, a view shared by Lavie (2006). Pandza and Thorpe (2009) back this view through explicit reference to the uncertainty reducing “strategic sense-making” process.

This is a key consideration as dynamic capabilities deployment and performance effects are frequently confounded in literature. In addition to the benefits of avoiding

tautological reasoning, examining both successful and unsuccessful attempts at deployment practice should increase the explanation building capacity of this study (George 2005; Sayer, 1992).

Dynamic Capabilities are Difficult to Observe

Finally, a key challenge exists for both researchers and practitioners in knowing dynamic capabilities as they are argued to be hard to observe and audit (Lillis and Lane, 2007; Ambrosini and Bowman, 2009; Easterby-Smith et al, 2009; Newey and Zahra, 2009). In response, Lillis and Lane (2007) and Teece(2009c) suggest that dynamic capabilities could be assessed in terms of the nature of their intermediate outcomes when deployed and may require specific changes at different levels to be considered (i.e. understanding an organisational level change may require examination of intermediate managerial level outcomes to build understanding).

Generally, Zahra, (1999), Lee et al (2002), Zollo and Winter (2002), Teece (2007) and Augier and Teece (2009) suggest that dynamic capabilities can be inferred where dynamic is taken to mean alignment with the environment and a clear empirically measurable indicator of performance can be assessed– survival in the face of environmental change

More specifically, in maintaining a dissociation with firm performance effects, Helfat et al (2007); Teece, (2007); Augier and Teece (2009) and Lichtenthaler and Lichtenthaler (2009) suggest that various dimensions of dynamic capabilities performance can be assessed in terms of their ‘fitness’. These authors nominate technical, evolutionary and entrepreneurial aspects where technical fitness refers to how well a capability performs its function; evolutionary fitness describes how well a capability fits the environment in which the firm operates and entrepreneurial fitness describes how well a firm’s dynamic capability can shape the external environment.

The implications for this thesis are that dynamic capabilities should be examined in terms of their direct outcomes – that is, changes to the resource base – rather than any further indirect performance impacts. Also, to understand how dynamic

capabilities are deployed at an organisational level, it may be necessary to examine specific change event outcomes at a level below (i.e. the managerial level). Furthermore, the concepts of 'fitness' might be harnessed to compare different deployments of dynamic capabilities to understand relative efficacy and efficiency of approaches.

Chapter Summary and Conceptual Map

As indicated in the thesis overview diagram 1.1., the aim of the literature review was to address several questions – What is the state of the literature? Where can a contribution be made? What definitions and terminology are adopted for the remainder of this thesis?

Analysis of the meta-data related to the structured literature review suggests that the field of dynamic capabilities has a burgeoning base of empirically grounded papers with a growing emphasis on quantitative methods. Questions are raised about the influence of quantitatively-oriented paradigms on the field which will be addressed in the discussion chapter 7.

Diagram 2.6 summarises the findings of the structured literature review in terms of theoretical definitions. Aligning with a Helfatian view, dynamic capabilities are proposed as meta-constructs which can be examined at different levels, the lowest of which is described by the concept of dynamic managerial capabilities.

Dynamic capabilities are argued to be describable in both potential and realised dimensions and relatedly both processes and capabilities are argued to comprise of a blend of routine and agential components.

Literature suggests that dynamic capabilities depend on managers – not only for component dynamic managerial capabilities but also for the input of resource and attention in order to execute constituent processes (such as resource allocation). This makes dynamic capabilities dependent in part on the attributes of managers and also makes them vulnerable to human failings. As such, dynamic capabilities describe a

potential to make purposeful change to the resource base but in no way guarantee success of such endeavours.

Also, it is argued that whilst the outcomes of dynamic capabilities might have the potential to create competitive advantage, dynamic capabilities do not in themselves represent a direct source of competitive advantage. We should therefore avoid linking dynamic capabilities to competitive performance directly. Instead dynamic capabilities can be measured and understood in terms of their intermediate outputs and also along various dimensions of 'fitness' to assess their efficiency and efficacy in making intended change to the resource base.

In relation to the external environment, dynamic capabilities might make adjustments to the resource base in response to market conditions, proactively to create market change or in the maintenance of real options for managers. Being grounded in the logic of opportunity, dynamic capabilities are argued to offer the potential to obtain Schumpeterian rents – the spoils available in the disequilibrium caused by disruptive change. This is a key difference to the logic of leverage and associated Ricardian rents associated with the resource based view which describes the gains which can be made through the exploitation of VRIN resource in equilibrium conditions. Both RBV and a dynamic capabilities view share an internal focus on resources and as such have much in common. However, this difference in underlying logic is argued to promote dynamic capabilities over RBV as a theory capable of explaining how resources should be managed in a dynamic and turbulent business environment.

This structured literature review was intended to systematically, transparently and reproducibly examine extant dynamic capabilities literature. It is argued that this goal has been achieved in so far as a rationale was applied to select papers for review, the boundaries applied were made explicit, the sources drawn from for review were made clear and a structured methodology was defined which could be repeated by an independent researcher. It was also intended that the state of the literature be defined and a possible area for contribution to dynamic capabilities literature be identified as has been achieved as described above. The final aim was to define key concepts and

theoretical definitions in underpinning the argumentation presented in the remainder of the thesis. This has been attempted and summarised in diagram 2.6.

The following chapter will draw on this initial high level review and further aspects of dynamic capabilities literature in order to sharpen the focus of the thesis through the creation of a conceptual framework.

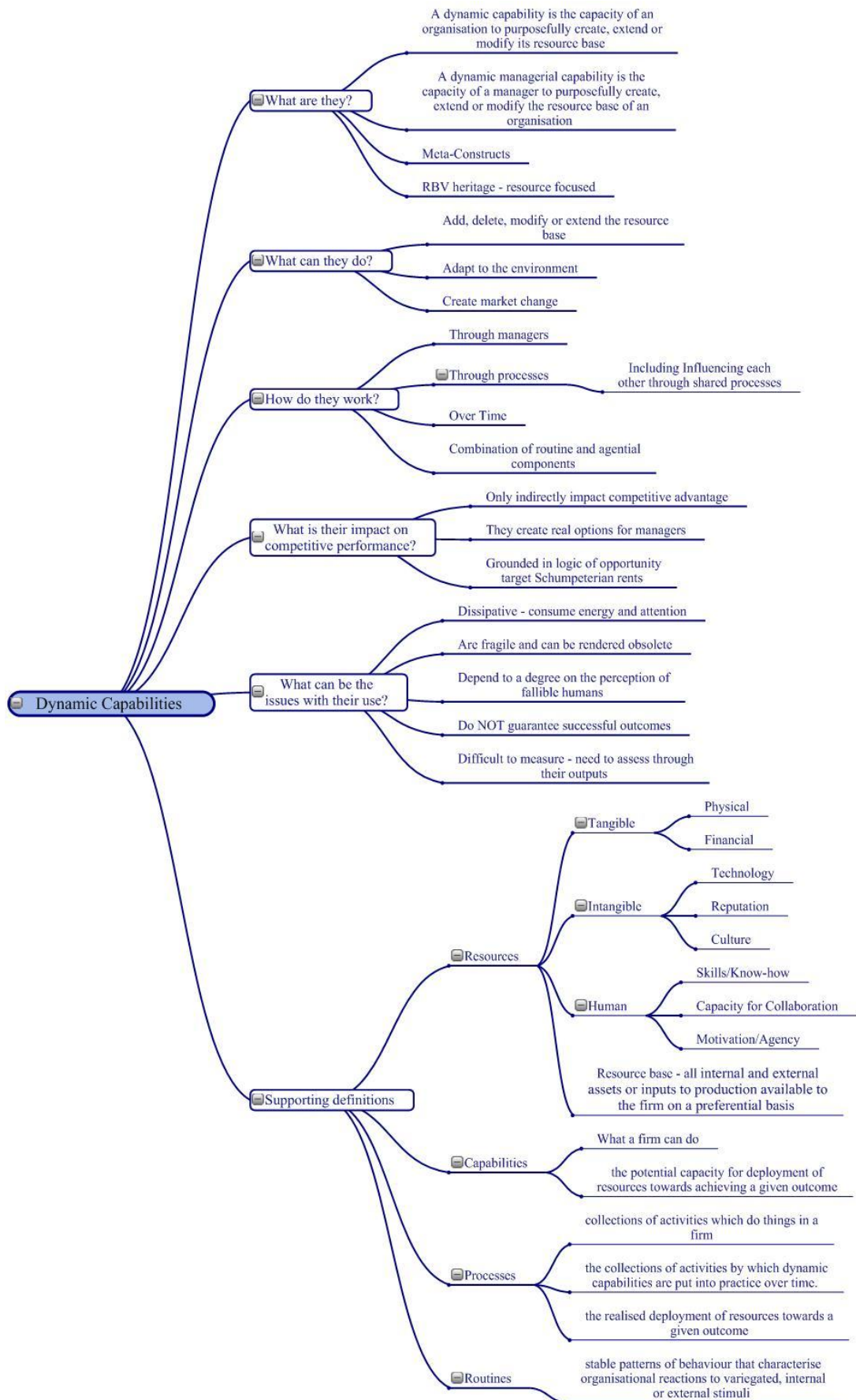


Diagram 2.6 - Conceptual Map of Findings of Structured Literature Review

Chapter 3 – Developing A Conceptual Framework

“Why should colleagues give credence to this particular representation of the phenomena? The answer lies in the logic underlying the model. The soundness of fundamental views of human nature, organisational requisites, or societal processes provide the basis for judging the reasonableness of the proposed conceptualisation”

David A. Whetten (1989, p491)

Then Editor, Academy of Management Review

Chapter Abstract

This chapter aims to develop a parsimonious conceptual framework of the factors which necessarily influence the deployment of dynamic capabilities. In light of the findings of the previous chapter, a research design decision is taken to set the principal **level of analysis at the managerial level**. As a consequence, the research question is refined to, **“how are dynamic managerial capabilities deployed in practice?”**

The **unit of analysis** is identified as “attempted purposeful strategic change to the resource base instigated by a manager” where strategic refers to change events which are purposeful, non-operational and of long term consequence to the business. Also, the need to investigate changes which are unsuccessful as well as successful is also suggested.

Thematic analysis of the structured literature review findings suggests a broad range of factors which are argued conceptually and empirically to impact dynamic capabilities deployment. From a critical realist perspective, in creating real world effects a mechanism such as dynamic capabilities will have factors which are intrinsic to its operation whilst other factors are extrinsic, creating mitigating effects. These categories of factors are referred to respectively as **necessary and contingent factors**. The factors which are identified from literature as impacting dynamic capabilities deployment effects are sorted into those which are necessary and those

which are contingent. The necessary factors are shaped into a **micro-process level conceptual framework** of dynamic managerial capabilities deployment.

Finally, a set of sub-research questions are identified as:-

- How do the necessary factors of dynamic managerial capabilities deployment affect purposeful change to the resource base?
- How do sequential deployments of dynamic managerial capabilities interact?
- How do concurrent deployments of dynamic managerial capabilities influence each others?

It is argued that answering these questions from empirical investigation will facilitate the main revised research question of “how are dynamic managerial capabilities deployed in practice?” to be addressed from a critical realist perspective.

Introduction

According to Whetten, (1989), making a theoretical contribution requires a balance of comprehensiveness and parsimony in the identification of elements of a conceptual framework, as well as clear indication as to how the different elements are related and why they should be structured as such. He suggests that a researcher should start by including more than is required, before liberally editing down to a focused, well-justified model.

Having settled on an integrative Helfatian definition as the theoretical kernel of this thesis and clarified related general characteristics, the task undertaken by this chapter is to build a related parsimonious framework and questions for empirical investigation which will contribute to addressing aspects of the question, “How are dynamic capabilities deployed in practice?”

Critical Realism and Conceptualisation

According to Sayer (2000, p27),

“A common aspect of all critical realist research is the priority given to conceptualisation and abstraction, for how we 'carve up' and define our objects of study tends to set the fate of any subsequent research. Realists seek substantial connections among phenomena rather than formal association or regularities. In explaining associations, they seek to **distinguish what must be the case from what merely can be the case**⁸.”

Critical realist authors such as Bhaskar (1975); Outhwaite (1987); Collier (1989); Tsoukas (1989, 1994); Sayer (1992, 2000); Reed (1997); Pratten (2000); Easton, (2000) and Ackroyd and Fleetwood (2000) comment on the stratified and differentiated nature of reality. Using a variety of terminology, these authors communicate the view that what a (social or natural) object can do (through its mechanisms and powers) exists in the REAL domain; in the ACTUAL domain, what it is able to do in any event is determined by complex interactions with other real world objects, and finally, the EMPIRICAL domain represents what we can experience of actual events. Table 3.1 below represents these notions as espoused by Bhaskar (1975, p41):-

	Real	Actual	Empirical
Mechanisms / Powers	√		
Events	√	√	
Experiences	√	√	√

Table 3.1 – A Stratified View of Reality (adapted from Bhaskar (1975, p41))

A differentiated and stratified view of reality is central to critical realist grounded research into mechanisms from the social world such as dynamic capabilities. To frame further explanation, an example is considered from the natural world of “explosive” material such as Trinitrotoluene (TNT). In the stratified view of reality,

⁸ Emphasis added

TNT exists in the real world and has powers (e.g. capacity to explode) and liabilities (e.g. capacity to be detonated). Whether or not these powers and liabilities of TNT are exercised in the actual domain is contingent on TNT's interaction with other real objects such as oxygen or electric current. As such, the nature of the events occurring in the actual domain is contingent upon the presence and interactions of objects in the real domain. Furthermore, if we observe TNT in an inert nitrogen-filled atmosphere, our sense experience will be of a non-explosive material. The real object that is the TNT under observation has not lost its capacity to explode however and would do so under different circumstances– in this case, its power to explode is contingently counteracted by the powers of a different real world object (Nitrogen). (Sayer, 1981,1992; Tsang and Kwan, 1999).

In the context of this thesis, a stratified view of reality implies that what dynamic capabilities are able to do (their real mechanisms), what they actually do (their impact on events in actuality) and the partial view of events available to any researcher (through sense experience in the domain of the empirical) are likely to be different. Based on the findings of chapter 2, it can be argued that capabilities refer to the unmitigated potential of dynamic capabilities in the domain of the real; processes refer to the realised activity of dynamic capabilities in the domain of the actual and the perceived nature of events held by managers is rooted in the domain of the empirical.

The relevance of this ontological perspective to this thesis is two-fold. Firstly, when developing a conceptual framework for dynamic capabilities deployment, it should be addressed at the real domain which requires a further set of considerations as outlined below. Secondly, research design should take account of the flawed and limited view available to the researcher by triangulating data collected (to better understand actual events) and mix analytical methods (to better explain real world powers in terms of corroborated accounts of actual events). Such considerations are addressed in the next chapter.

Distinguishing what must be the case from what can be the case

From a critical realist perspective, the differentiated nature of reality introduces a research imperative to identify factors which **must** be associated with the nature of an object in the real domain. Such factors are referred to as intrinsic or **necessary** and would be evident if the real object were to operate unmitigated by other real objects. **Contingent** factors on the other hand are attributes which are extrinsic to the real object – whilst they may be experienced in the empirical world they are not necessarily related to its nature. In the TNT example, the instability of the chemical formulation is an intrinsic or necessary attribute – regardless of what is experienced in the empirical world, the formula will always be unstable. On the other hand, the status of not exploding is extrinsic or contingent – clearly such a condition **can** be experienced empirically but other empirical observations **can** be made (i.e. it exploding!).

This is an important point when endeavouring to create a conceptual framework from literature for a social world mechanism such as dynamic capabilities. As positivism collapses the empirical domain with the real domain (Bhaskar 1975), factors which are, from a critical realist perspective, contingent to dynamic capabilities might be argued to be necessary. Mutch (1999); Ackroyd and Fleetwood (2000) and Kwan and Tsang (2001) suggest that in reality this is not a major issue as most publishing authors, regardless of philosophical position, are cognisant of the necessarily limited nature of their contributions and frame their findings accordingly. However, this line of argument implies that extant theory must be critically reviewed rather than compiled in a summative manner when developing a conceptual framework- how this is to be done which will be developed in this chapter's methodology section.

Levels of Analysis

A further consideration in the development of the conceptual framework from a critical realist perspective is the level of analysis. If we accept that dynamic capabilities are social mechanisms, and that “social mechanisms and processes operate at different levels of abstraction that tie into each other within a stratified, multilevel and relational model of society” (Reed, 1997, p31), then the notion of

emergence suggests that if we wish to understand how an organisation is managed, it is not simply a matter of summing the efforts of individual managers or resources. Instead, we have to pick research questions, techniques of inquiry and supporting theory to develop an approach to research which respects and preserves the stratified nature of management in reality – Tsoukas’(1994) proposal of a meta-theory of management is an exemplar of such critical realist ontological views being applied.

A research design decision is therefore required to specify a main level of analysis for this study which allows a meaningful conceptual framework to be developed. Sharing Adner and Helfat’s (2003, p1012) already quoted view that “an answer to the question of what makes firms different requires an answer to the question of what makes managers different” - a managerial level of analysis is set as the primary level of inquiry. This suggests that the main research question should be revised to

“How are dynamic managerial capabilities deployed in practice?”

What are the implications for the original question of “how are dynamic capabilities deployed in practice?” Taking the view that dynamic capabilities are hierarchical, with dynamic managerial capabilities at the base, it may be possible to derive understanding about organisational level changes from analysis over time of the compound effects of dynamic managerial capabilities. As suggested in chapter 2, this is not a matter of simply summing outputs of dynamic managerial capabilities but rather requires more careful retroductive and interpretive analysis of underlying necessary and contingent factors in play over time. Therefore, the original question is retained as a secondary line of inquiry and organisational level effects will be examined as a secondary level of analysis. Such activity will be accommodated in the development of the methodology in chapter 4 and the effectiveness of the secondary line of investigation will be critically appraised in chapter 7.

Based on these design decisions, a dynamic capabilities hierarchy is conceived as depicted in diagram 3.1.

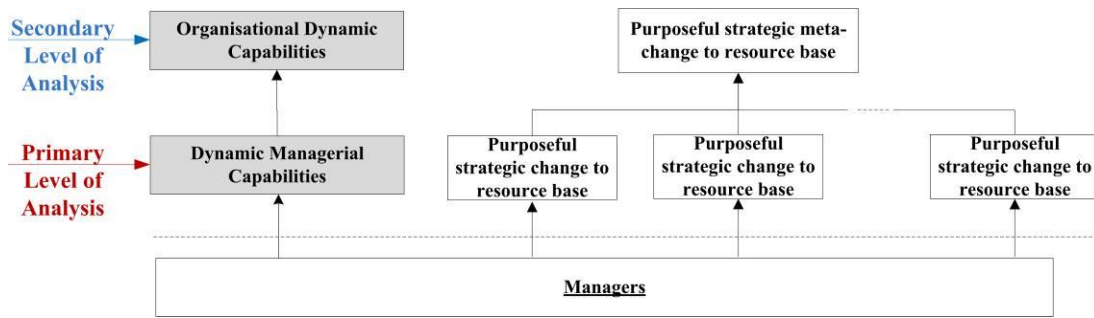


Diagram 3.1 – Dynamic Capabilities Hierarchy

Adopting a managerial level of analysis is considered advantageous in several ways. Firstly, in practical terms the activities of individual managers are expected to be easier to track and interrogate than organisational level group activities involving a plurality of actors. Relatedly, considering the views of Campbell and Sommer Luchs (1997), dynamic managerial capabilities might be considered less opaque than organisational level dynamic capabilities, aiding analysis and theorising. Furthermore, by targeting the ‘bottom level’ of a dynamic capability hierarchy, empirical study is directed towards investigation of managerial intervention, which aligns strongly with the author’s original motivations.

Unit of Analysis

Easterby-Smith et al (2002, p42) describe the unit of analysis as “the entity that forms the basis of any sample”. Tharenou et al (2007) add that the unit of analysis should be central to the phenomena being studied. These points considered the unit of analysis for this thesis is defined as an **attempted purposeful strategic change to the resource base instigated by a manager**.

For clarity, change events may apply to tangible, intangible or human resource elements of the resource base as outlined in diagram 2.3. Also, Jarzabkowski’s (2005) rationale is borrowed in defining a strategic change as one which is purposeful, non-operational and of long term consequence to the business (therefore, an activity such as purchasing a large volume of material from an established supplier for use in a manufacturing order would not be considered as deploying dynamic managerial capabilities in making an addition to the strategic tangible resource base).

Furthermore, it is important to note that attempted changes will not be discriminated based on outcomes achieved – both unsuccessful and successful outcome events will form the unit of analysis. As such, this study should avoid potential traps of tautological reasoning. Further implications of examining unsuccessful as well as successful change events relating to literal and analytical replication will be addressed in the data analysis section of chapter 4.

It is worth noting that dynamic capabilities should not be considered synonymous with strategic change despite the unit of analysis defined above. As noted in chapter 2, strategic change can happen through luck, improvisation or as the unintended consequence of different organisational activity, none of which constitute the deployment of dynamic capabilities. As the mechanisms of purposive strategic change, dynamic capabilities therefore do not fully align with the notion of strategic change.

Critical Realist Impacts Summary

As a precursor to developing a conceptual framework, explication of the impacts of a critical realist philosophy have highlighted two concerns. Firstly, the differentiated nature of reality has emphasised the importance of distinguishing between necessary and contingent factors influencing dynamic capabilities in deployment. Secondly, the stratified nature of reality required the level of analysis to be clarified. A managerial level was identified as the primary level of analysis, with an organisational level being considered as a secondary level. Aligned with a managerial level of analysis, the unit of analysis is identified as attempted purposeful strategic changes to the resource base instigated by a manager and the principal research question was revised to “How are dynamic managerial capabilities deployed in practice?”

On the basis of these clarifications, an approach for developing the conceptual framework is now described.

Outline of Approach to Developing the Conceptual Framework

Whetten (1989, p490) notes that conceptual frameworks “are as likely to obfuscate as they are to clarify meaning”, hence his call for parsimony as suggested at the start of this chapter. In light of the view of Barreto (2010) that extant literature offers a wide variety of influencing factors on the development and deployment of dynamic capabilities, this would seem a relevant concern for this thesis. As such, this section aims to describe an appropriate approach to developing the conceptual framework which respects the requirements of a critical realist philosophy whilst avoiding confusion by profusion.

In brief, thematic analysis is used to distil detailed commentaries and empirical evidence of influencers of dynamic capabilities down to simple summaries (with appended supporting evidence). Extant dynamic capabilities empirical studies are used as the basis for arguing which factors are necessary to the deployment of dynamic managerial capabilities distinct from those which are contingent. This approach is based on ‘etic’ categories – that is, the themes are nominated by the researcher rather than being based on a specific model from literature (Maxwell, 2005). The relative merits and merits and weaknesses of such an approach will also be addressed.

Thematic Analysis Approach

According to Miles and Huberman (1994, p131), thematic clustering can be conducted via a number of tactics, including seeing patterns (gestalts) and factoring- “seeing a few general variables underlying many specifics”. In the case of written material, this may start with repeated readings of the texts (Maxwell, 2005) to take notes and clarify meaning. This subsequently enables a qualitative ‘fracturing’ and reassembly of the original data into theoretical thematic clusters (Strauss (1987), in Maxwell (2005)).

Based on these views, the following approach was developed to conduct thematic analysis on the structured literature review findings. Within the boundaries described

in chapter 2, dynamic capabilities literature was reviewed and notes (2676 individual entries) recorded in the Access database. These notes captured key quotations, contextual comments and observations. Also at this time, the source papers were also identified as theoretical, empirical qualitative and empirical quantitative according to the nature of the content.

Through repeated reading, the notes taken were reassembled in two ways. Firstly, high level categories suggesting factors which **could** influence dynamic capabilities deployment were developed as depicted in diagram 3.2.

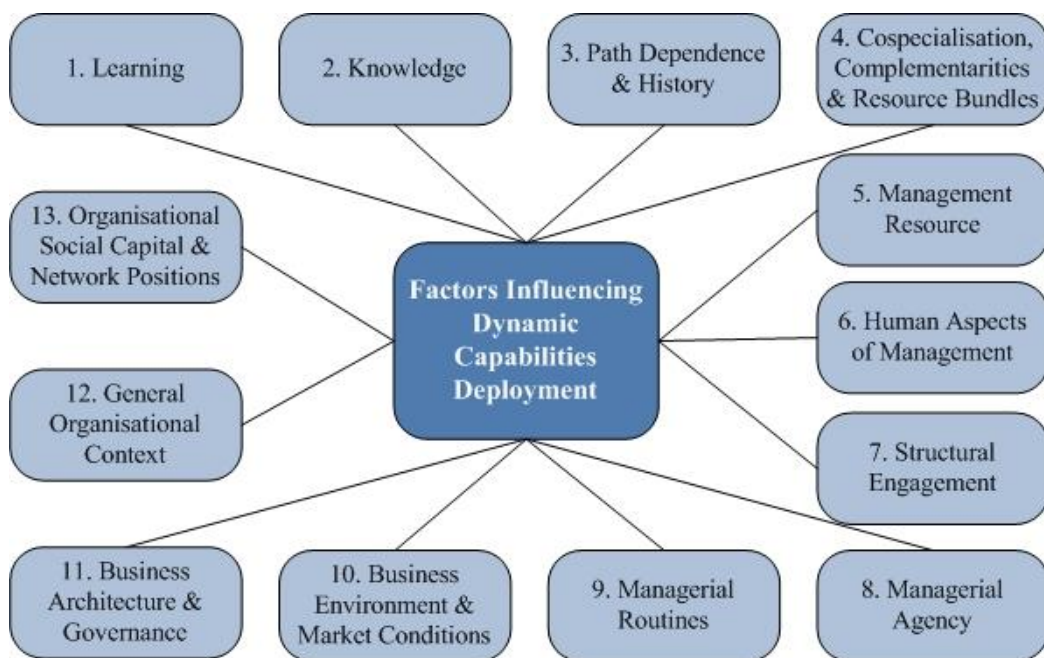


Diagram 3.2 – Literature-Based Categories of Factors Influencing Dynamic Capabilities Deployment

These categories were nominated in an emergent way. Reading through from note 1 through to note 2676, any entry suggesting a potential influencer of dynamic capabilities deployment which could not be classified under an existing heading resulted in a new heading being added (full explanation of the meaning of each heading is offered in the second half of this chapter). The numbers used are purely for reference and do not indicate any order of priority.

Re-reading of the notes and source data led to a number of themes being developed under each category (as well as confirming the existing categories). For example, under the first category, learning, two themes were found to be enduring throughout literature relating the deployment of dynamic capabilities. The first theme (1a) was that “If learning is a continuous process, then previous deployments of dynamic capability may yield unintended/organic experiential learning which will influence future deployments” whereas the second, theme 1b – “The deployment of deliberate learning mechanisms may impact how dynamic capabilities are deployed in practice”. The evidence supporting this exercise is presented in full appendix 3.1

A final reading of the notes and literature supported analysis of the thematic findings to separate necessary and contingent factors of dynamic capabilities deployment. To do this, all available empirical evidence was drawn on for enlightenment through example when separating ‘what must be’ from ‘what can be’. A map of the supporting empirical evidence is presented in diagram 3.3. This was a painstaking exercise, the results of which are presented later in this chapter.

In reviewing the approach adopted, some strengths are identified. Denyer and Tranfield’s (2006, p223) warning highlighted in chapter 2 that “existing management research will not contribute to management practice if individual studies simply accumulate in academic journals” is addressed at least in part by this exercise. By drawing on the full body of empirical-based publications, as well as the theory previously described, existing dynamic capabilities research focussing on deployment is integrated.

The second proposed strength addresses Levinthal’s (1995) view that traditional quantitative research approaches may be inappropriate for developing understanding of subjects such as dynamic capabilities from a process perspective (previously highlighted in chapter 2). The literature reviewed spanned a wide range of

methodological approaches and multiple sources of ‘screened⁹’ evidence are offered for each theme. As such, for no emergent theme does the evidence depend solely on quantitative empirical findings. In other words, the argumentation of contingent and necessary factors is based on a broad and detailed foundation in literature.

There are also inherent weaknesses in this approach. Firstly, it is immensely time consuming. On one level this is more an inconvenience than a drawback (although it is fully accepted that the PhD thesis requires dedication and the investment of as much time as is necessary!). However, there are subsequent implications for the validity of such an approach. For a solo endeavour such as a PhD thesis, detailed secondary coder validation was inhibited by practical considerations. Whilst concessionary measures were undertaken (such as review of material by supervisors and other relevantly enlightened colleagues) it is recognised that the development of the conceptual framework will inevitably be subject to a degree of bias reflecting the author’s interpretation of literature.

These points will be developed further in chapter 7 through critical reflection about the overall approach adopted in the thesis. The following section now presents the findings of the thematic analysis, leading to the presentation of contingent and necessary factors influencing the deployment of dynamic managerial capabilities.

Factors Influencing Dynamic Capabilities Deployment

Below are detailed the findings of the thematic review of literature aiming to identify the factors necessarily influencing deployment of dynamic managerial capabilities. The categories are presented in numbered order as displayed in diagram 3.2. For each category, the following subsections are offered:-

- An overview theoretical perspective
- Identified themes and related empirical support (further details in appendix 3.1)
- Discussion of the necessary or contingent nature of identified factors

⁹ The term screened reflects the paper-by-paper reconciliation of findings against methodology in line with the critical realist concerns of avoiding conflation of empirical and real domains as highlighted earlier in this chapter

In line with Whetten's (1989) view, this section considers the views of all papers from the structured literature review and narrows down the findings to identify the appropriate elements for inclusion in a parsimonious conceptual framework which is bounded (a) at the managerial level (b) by necessary factors.

For clarity, the discussion subsection is not a review of the importance of identified elements. Indeed as the detail below will show, many contingent factors can have profound impacts on dynamic capabilities deployment. Instead, the necessary factors are considered to be those elements which must be associated with the deployment of dynamic managerial capabilities (even if their effects may be mitigated contingently by other factors).

1 - Learning

Overview Theoretical Perspective

A widely held view is that dynamic capabilities can be developed and improved through experimentation and learning (Teece et al, 1997; Eisenhardt and Martin, 2000; Schreyögg and Kliesch-Eberl, 2007; Zollo and Winter, 2002; O'Connor, 2008; Ambrosini et al, 2009; Mahoney, 1995; Bowman and Ambrosini, 2003; Marsh and Stock, 2003; Easterby-Smith and Prieto, 2008; Ambrosini and Bowman, 2009; Dixon et al, 2010). Learning is argued to play a major role in the development of dynamic capabilities at an individual, group and organisational level and can be a deliberate, social process (Teece and Pisano, 1994, Teece et al, 1997, Lichtenthaler and Lichtenthaler, 2009). Well cited authors on learning, Zollo and Winter (2002, p344), suggest that “Dynamic capabilities emerge from the coevolution of tacit experience accumulation processes with explicit knowledge articulation and codification activities”. According to Zahra et al, (2006), firms become more deliberate and less experimental in their learning approaches as they develop and mature

Thematic Empirical Evidence

Theme 1a - if learning is a continuous process then previous deployments of dynamic capability may yield unintended/organic experiential learning which will influence future deployments.

Qualitative evidence - Camuffo and Volpato (1996); Forrant and Flynn (1999); Athreye et al (2009)

Quantitative evidence – Bhatt and Grover’s (2005); Kale and Singh (2007); Sarkis et al (2010)

Theme 1b - The deployment of deliberate learning mechanisms may impact how dynamic capabilities are deployed in practice

Qualitative evidence – Salvato (2003); Pandza et al (2003b); Blomqvist et al (2004); Anand et al (2009); Salvato (2009); Kale (2010)

Quantitative evidence - Bierly and Chakrabarti (1996); Garcia-Morales et al (2007); Azadegan et al (2008); Jarratt (2008); Karim (2009); Malik and Kotabe (2009)

Implication relating to dynamic capabilities deployment in practice

Whilst empirical evidence supports the notion that deliberate learning mechanisms enhance the deployment of dynamic capabilities, their use is strictly optional and they are considered **contingent to practice** in the conceptual framework. On the other hand, there is a body of evidence to suggest that learning occurs through each deployment of dynamic capabilities- it may be unintended, it may be incremental and it may be flawed – but the very act of deploying dynamic capabilities generates at a minimum a form of experiential learning for those involved. As such it is deemed intrinsic to the act of making a change to the resource base **and learning is argued to be a NECESSARY outcome** of the practice of deployment.

2 - Knowledge

Overview Theoretical Perspective

Knowledge stocks/resources and management are highlighted as being of significant influence on dynamic capabilities by authors such as Zahra and George(2002a), Zollo and Winter (2002), Marsh and Stock (2003), Sambamurthy et al (2003), Wang and Ahmed (2007), Easterby-Smith and Prieto (2008), Augier and Teece, (2008), Easterby-Smith et al (2009), Pandza and Thorpe (2009), Siguaw et al (2006), Lichtenthaler and Lichtenthaler (2009), Cetindamar et al (2009) and Macpherson et al (2004). Marsh and Stock (2003) suggest that knowledge from previous firm activities represent a pool of valuable resource which a firm can draw on through dynamic capabilities. Pil and Cohen, (2006) and Fixson (2005) suggest that both product and organisational architecture can be shaped to improve knowledge flows and aid dynamic capabilities. Ng (2007) proposes that absorptive capacity and weak ties to a large number of organisations can significantly increase an organisations stock of external knowledge which in turn benefits dynamic capabilities.

Closely related to knowledge management is the notion of absorptive capacity. Cohen and Levinthal (1990) originally described absorptive capacity as the firm's ability to value, assimilate, and apply new knowledge to commercial ends. In the context of dynamic capabilities, absorptive capacity is defined as “a set of organisational routines and processes by which firms acquire, assimilate, transform,

and exploit knowledge to produce a dynamic organisational capability” (Zahra and George, 2002a, p186). Many authors suggest that absorptive capacity has a profound impact on the deployment of dynamic capabilities and in doing so, can be assessed in terms of potential and realised dimensions. (Wang and Ahmed, 2007; Zahra and George, 2002a, b; Lavie, 2006; Ambrosini and Bowman, 2009; Fink and Markovich, 2008)

Thematic Empirical Evidence

Theme 2a – Knowledge management processes and routines (or absorptive capacity) help to distribute and use knowledge stocks from internal and external sources during the deployment of dynamic capabilities

Qualitative evidence - Verona and Ravasi (2003); Bruni and Verona (2009)

Quantitative evidence – Bierly and Chakrabarti (1996); Sher and Lee (2003); Narasimhan et al (2006); Cepeda and Vera (2007); Lichtenthaler (2009); Macher and Mowery (2009); Sarkis et al (2010)

Theme 2b – Internal knowledge stocks are drawn on during the deployment of dynamic capabilities

Qualitative evidence – Iansiti and Clark (1994); Pandza et al (2003a); Salvato (2009); MacCormack and Iansiti (2009)

Quantitative evidence – Helfat (1997); Marsh and Stock (2006); Garcia-Morales et al (2007); Rothaermal and Hess (2007); McKelvie and Davidsson (2009)

Theme 2c – External knowledge stocks from partner organisations are drawn on when deploying dynamic capabilities

Qualitative evidence – Iansiti and Clark (1994); Tripsas (1997); Petroni (1998); Blomqvist et al (2004); Newey and Zahra (2009)

Quantitative evidence – No explicit links identified

Implication relating to dynamic capabilities deployment in practice

A robust body of empirical evidence clearly indicates that available knowledge stocks and knowledge management practices can be highly advantageous to the on-going deployment of dynamic capabilities. However, that this is the case does not

make knowledge management or knowledge necessarily a required part of dynamic capabilities deployment. In practice, can a senior manager effectively make strategically important additions to the resource base without drawing on organisational knowledge? Depending on approach, it is not inconceivable that an owner/senior manager could hire a new manager, representing a strategic modification to the available resource base of the organisation, without drawing on stocks of organisational knowledge or using knowledge management practices.

Available empirical evidence strongly implies a potential for knowledge to enhance the results achievable through dynamic capabilities, further catalysed by knowledge management approaches. However, **organisational knowledge stocks and flows must be considered extrinsic and therefore contingent** to a manager-centric model of the practice dynamic capabilities deployment.

3 - Path Dependence and History

Overview Theoretical Perspective

Dynamic capabilities are considered to be path dependent and firms within an industry will have different abilities and options depending on their previous activities. In this sense, there is widespread agreement that history matters (Teece and Pisano, 1994; Eisenhardt and Martin, 2000; Teece, 2007; Schreyögg and Kliesch-Eberl, 2007; Ambrosini et al, 2009; Zahra and George, 2002a; Zott, 2003).

As a consequence, at many stages of a firm's life, its managers make "quasi-irreversible commitments to certain domains of competence" and the paths available to a firm may be narrow (Teece et al, 1997, p515) although arguably the role of dynamic capabilities is to create new trajectories for the firm (Pandza and Thorpe, 2009, Dixon et al, 2010).

Thematic Empirical Evidence

Theme 3a – How dynamic capabilities are deployed is in part determined by resource stocks and capabilities which are the embodiment of previous decisions and deployments of dynamic capabilities

Qualitative evidence - Wonglimpiyarat (2004); Lazonick and Prencipe (2005); Harreld et al (2007); Holweg and Pil (2008); Athreye et al (2009); Ellonen et al (2009); Townsend et al (2010)

Quantitative evidence – King and Tucci (2002); Karim (2006); Zuniga-Vicente and Vicente-Lorente (2006)

Theme 3b –Dynamic capabilities may require deployment over a sustained period of time in order to effect certain types of change

Quantitative evidence – Forrant and Flynn (1999); Galunic and Eisenhardt (2001); Pandza et al (2003b)

Quantitative evidence – Chang (2003)

Implication relating to dynamic capabilities deployment in practice

The question of path dependence is an enduring theme throughout dynamic capabilities theoretical literature and the empirical evidence further suggests that what is done in the present is at least in some way a function of the past. That there is some form of historical influence is logical given the temporal considerations of the dynamic capabilities construct. Consequently, **history/previous paths are considered to be a NECESSARY antecedent component** of any deployment of dynamic capabilities. However, empirical evidence also raises questions as to the degree that history has an influence, both regarding the intended change and the way in which it is conducted (perhaps reflecting the uncertainty of theory inherent in phrases such as ‘quasi-irreversible’). Therefore, **better understanding the way in which previous paths influence the deployment of dynamic capabilities in practice could make a contribution to knowledge.**

4 - Cospecialisation, Complementarities and Resource Combinations

Overview Theoretical Perspective

Co-specialised and complementary assets can be developed through dynamic capabilities and also potentially have a synergistic effect on the development and deployment of dynamic capabilities (Teece, 2006; Augier and Teece, 2009). Co-specialised assets increase in value when used with other particular assets and can

create hard to imitate strategic assets for an organisation (Zahra, 1999; Teece, 2007). Investment in the development of strategic resources and complementary assets can therefore have a major impact on dynamic capabilities at a point in the future (O'Connor, 2008, Zahra, 1999, Ng, 2007, Augier and Teece, 2008). Of particular note in theoretical literature is the subject of dynamic capabilities and information technology resources - theory is rich in suggestion that investment in information technology will be highly influential on dynamic capabilities deployment (Zahra and George, 2002b; Wheeler, 2002; Sambamurthy et al, 2003; Easterby-Smith and Prieto, 2008; Fink and Markovich, 2008).

Thematic Empirical Evidence

Theme 4a – Availability of balanced resources for use or combination with other resources influences if and how a firm might deploy dynamic capabilities

Qualitative Evidence – Camuffo and Volpato (1996); Verona and Ravasi (2003); Taylor and Helfat (2009); Williams and Lee (2009)

Quantitative Evidence – Menguc and Barker (2005); Banker et al (2006); Azadegan et al (2008) Fink and Neumann (2009)

Theme 4b – Information technology is a key enabler of dynamic capabilities

Qualitative Evidence – Bruni and Verona (2009)

Quantitative Evidence – Zhu and Kraemer (2002); Sher and Lee (2003);

Vaidyanathan and Devaraj (2008);

Theme 4c – Existing strategic assets strongly influence how a firm can deploy its dynamic capabilities

Qualitative Evidence – O'Connor and DeMartino (2006); Butler and Murphy (2008); Ellonen et al (2009); Maklan and Knox (2009)

Quantitative Evidence – Marcus and Anderson (2006); Narasimhan et al (2006); Rothaermal and Hess (2007); Morgan et al(2009); Fang and Zhou (2009)

Implication relating to dynamic capabilities deployment in practice

Empirical evidence suggests that dynamic capabilities will be highly influenced by the availability, form and function of not just simple resources but also combinations (possibly highly complex) of resources. IT resources are highlighted by theory and empirical evidence as key enablers of dynamic capabilities but only when used in

combination with other resources. Extant empirical evidence shows how resources can be used by managers and staff in combination over time (through processes) in a manner which is highly influential on the deployment of dynamic capabilities. However, drawing on stocks of extant strategic resources is not compulsory to the deployment of dynamic capabilities. Taken to an extreme, Newbert (2005) presents an argument that nascent entrepreneurs demonstrate the deployment of dynamic capability when setting up a firm when they lack extant resources on which to draw (and therefore end up in debt). As with deliberate learning mechanisms and knowledge, existing resources are shown through existing literature to have potentially valuable amplifying effects on the outcomes of dynamic capabilities deployment. However, for this critical realist conceptual framework, **resource bundles are considered contingent**.

5 - The Physical and Functional Resource of Management

Overview Theoretical Perspective

On a functional level, a key proposition is that the resource of **management** plays a crucial role in coordinating the deployment and redeployment of resources as well as the integration of new and existing resources (Helfat and Peteraf, 2003; Teece, 2007; Teece et al, 1997; O'Reilly III and Tushman, 2008; Amit and Schoemaker, 1993; Zahra and George, 2002a; Augier and Teece, 2009). Reflecting a Penrosian view, Mahoney (1995, p95) comments that “the key to the management of resources is the resource of management”, further suggesting that ultimately adequate slack management resource will constrain the growth of a business, a view echoed by Augier and Teece, (2008). Mahoney (1995) also suggests that the management function can represent a VRIN resource for a firm. Barnett (2003) aligns with this view in suggesting that managerial attention as a resource is a critical limiting factor to the successful exploitation of a real options approach to dynamic capabilities.

Thematic Empirical Evidence

Theme 5a – Availability and use of managerial attention is a key determinant of the firm’s ability to deploy dynamic capabilities

Qualitative Evidence – Salvato (2003); Mathiassen and Vainio (2007); Pablo et al (2007); Lee and Kelley (2008); Witcher et al (2007); O'Reilly III et al (2009)

Quantitative Evidence – Daneels (2008)

Theme 5b – The management function plays a key role in shaping how dynamic capabilities will be deployed in a firm

Qualitative Evidence – Iansiti and Clark (1994); Macpherson et al (2004); Harreld et al (2007); Harris et al (2009); Salvato (2009); Taylor and Helfat (2009)

Quantitative Evidence – Adner and Helfat (2003); Liao et al (2009); Sirmon and Hitt (2009)

Implication relating to dynamic capabilities deployment in practice

Empirical evidence suggests that management resource is a key constraint on the deployment of dynamic capabilities. In the context of a manager-centric model, the management resource sets the 'purpose' in the Helfatian definition and must therefore at a minimum be able to have sufficient 'attention' to do so. As such, **the resource of management is considered necessary** to the conceptual framework.

6 - Human Aspects of Management – Individuals and Systems

Overview Theoretical Perspective

Individual managers are argued to be central to the concept of dynamic capabilities (Teece et al, 1997; Zahra et al, 2006; Ambrosini and Bowman, 2009; Augier and Teece, 2009; Dixon et al, 2010). On a cognitive level, managerial perceptions, entrepreneurial instincts and innovative capabilities are suggested by many authors as having a major impact on dynamic capabilities (Teece, 2007; Zahra et al, 2006; Schreyögg and Kliesch-Eberl, 2007; Ambrosini et al, 2009; Amit and Schoemaker, 1993; Zahra and George, 2002b; Wheeler, 2002; Aragon-Correa and Sharma, 2003; Sambamurthy et al, 2003; Lavie, 2006; Augier and Teece, 2008; Ambrosini and Bowman, 2009; Augier and Teece, 2009; Macpherson et al, 2004; Narayanan et al, 2009). In developing capabilities, "Managers' perceptions, preferences, capacities, and errors significantly influence the path taken and its results." (Zahra et al, 2006, p941). Further authors suggest that the managerial system as a whole needs to be marshalled as part of dynamic capabilities deployment (O'Connor, 2008; O'Reilly III

and Tushman, 2008; Augier and Teece, 2008), particularly where a shared point of view or mental model is required (Mahoney, 1995; Ambrosini and Bowman, 2009).

Thematic Empirical Evidence

Theme 6a – Characteristics of individual managers – their experience, skills, social capital and mental models – will be significant determinants of how they deploy dynamic capabilities

Qualitative Evidence – D’Adderio (2001); MacPherson et al (2004); Mathiassen and Vainio (2007); Lee and Kelley (2008)

Quantitative Evidence – Carpenter et al (2001); Adner and Helfat (2003); Kor and Mahoney (2005); Newbert (2005); Moliterno and Wiersema (2007); Peteraf and Reed (2007); Danneels (2008)

Theme 6b – Characteristics of the managerial system – the summative and usable experience, skills, social capital and mental models – will be significant determinants of how dynamic capabilities are deployed throughout an organisation

Qualitative Evidence – Petroni (1998); Rosenbloom (2000); Rindova and Kotha (2001); Gilbert (2006); O’Connor and DeMartino (2006); Aragon-Correa and Rubio-Lopez (2007); Athreye et al (2009); MacCormack and Iansiti (2009); Taylor and Helfat (2009)

Quantitative Evidence – Garcia-Morales et al (2007); Newbert et al (2008)

Implication relating to dynamic capabilities deployment in practice

In the practice of dynamic capabilities, empirical evidence suggests that the characteristics of the individual manager are highly influential in determining what they do during deployment. As the resource of management is considered necessary in terms of the framework, and dynamic capabilities practice is about what managers do, the perception of individual managers is considered a key determinant of practice – dynamic capabilities deployment will inevitably be influenced by the inherent world view of the manager. Furthermore, in that dynamic capabilities represent purposeful activity, it could be argued that the cognitive abilities and **perceptions of the individual manager represent a NECESSARY antecedent component** to the

deployment of dynamic capabilities. Dynamic capabilities deployment will necessarily be triggered by a manager's perception of reality; the condition of reality is itself a contingent antecedent in this framework.

Where managers are required to interact with other managers – as might be expected in organisation level resource change efforts – how other managers act (reflecting their own characteristics) may also have an impact on what managers do. Whilst empirical evidence supports the view that a unified managerial system may achieve great things through dynamic capabilities, it is not a required condition for the deployment of dynamic capabilities in practice at a managerial level– therefore, the **state of the managerial system is extrinsic to deployment practice.**

7 – Structural Engagement

Overview Theoretical Perspective

Culture refers to the values and beliefs that societal members hold; culture can be a de facto governance system as it mediates the behaviour of individuals and economises on more formal administrative methods (Teece et al, 1997). According to Amit and Schoemaker (1993, p42) “Organisations are complex social entities with their own inertia and constraints.” Expressed in different terms, culture may be considered a form of **societal structural inertia** (organisations being a form of society) where it represents routinised ways of “how things are done” - whether helping or hindering, culture is argued to influence the development and deployment of dynamic capabilities, a view shared by Rumelt (1995), Schreyögg and Kliesch-Eberl (2007), Bowman and Ambrosini (2003), O'Reilly III and Tushman (2008) and Lavie (2006). Managers need to provide the leadership to overcome organisational inertia and seize business opportunities (Easterby-Smith and Prieto, 2008) and appropriate social integration mechanisms aligned with culture can influence the impact and efficiency of dynamic capabilities (Zahra and George, 2002a; Blyler and Coff, 2003).

Thematic Empirical Evidence

Theme 7a – Organisational inertia may help the delivery of change to the resource base where change aligns in some way with the manner in which things are currently done

Qualitative Evidence – Petroni (1998); Pablo et al (2007)

Quantitative Evidence – King and Tucci (2002)

Theme 7b - Where change goes against established organisational norms, managers need to address related structural inertia in a socially intelligent way in order to deliver change

Qualitative Evidence – D’Adderio (2001); Galunic and Eisenhardt (2001); Buenstorf and Murmann (2005); Harreld et al (2007); Lee and Kelley (2008); Anand et al (2009); Narayanan et al (2009); Townsend et al (2010)

Quantitative Evidence – Uhlenbruck (2004); Capron and Mitchell (2009); Eggers and Kaplan (2009)

Implication relating to dynamic capabilities deployment in practice

Empirical evidence suggests that change which is aligned in some way with the way things are done may be assisted by organisational inertia (in the form of a favourable and efficient routinised response to change). The majority of empirical evidence is focussed more on overcoming structural inertia where change goes against the grain of the organisation and it is widely suggested that effort will be required to do so. It is argued that managers necessarily have to engage with some form of societal structure in order to make a change to the resource base (in line with the implicit co-ordinative function of management (Tsoukas, 1994)). In adding or using external resources, engagement is with suppliers/holders of the resource (tangible, intangible) or the resource itself (human). In managing tangible, intangible or human resources already within the boundaries of the firm, engagement with some or all aspects of the organisation will be required. Therefore, to deploy dynamic capabilities in practice, some form of **structural engagement is deemed a NECESSARY part** of a practice based model.

8 - Managerial Agency

Overview Theoretical Perspective

Where “agency means to have choices and to be able to effect some action towards those choices, albeit that their outcome may have unintended consequences” (Jarzabkowski, 2005, p29), authors such as O'Reilly III and Tushman (2008), Zahra (1999), Dixon et al (2010) and Narayanan et al (2009) argue that leadership and managerial agency are critical to the deployment of dynamic capabilities – “dynamic capabilities, which are conceptual in nature, have organizational consequences -both economic and human- only when they are part of the top management schema” (Narayanan et al, 2009, p37). More generally, managerial **agency** can have a major impact on the development and deployment of dynamic capabilities and therefore matters of managerial decisions, incentives alignment and collective bargaining can influence the organisational capacity for change (Teece, 2007; Amit and Schoemaker, 1993; Mahoney, 1995; Easterby-Smith and Prieto, 2008; Augier and Teece, 2008; Pandza and Thorpe, 2009). Managerial agency should not be portrayed as a wholly negative concern; it can play a necessary variation creating role which is useful in tackling new business problems - as no-one can anticipate what events will occur in the life of an organisation, non-patterned aspects of dynamic capabilities must exist.(Schreyögg and Kliesch-Eberl, 2007; O'Reilly III and Tushman, 2008)

Thematic Empirical Evidence

Theme 8a - Managerial agency relative to the change required impacts the form and legitimacy of deployment of dynamic capabilities

Qualitative – Rosenbloom (2000); Butler and Murphy (2008); Holweg and Pil (2008); Narayanan et al (2009); O'Reilly III et al (2009)

Quantitative – Carpenter et al (2001); Menguc and Barker (2005); Moliterno and Wiersema (2007); Eggers and Kaplan (2009); Skilton (2009)

Theme 8b - Managerial agency can act to the benefit of the organisation

Qualitative – Rindova and Kotha (2001); Salvato (2003); Salvato (2009)

Quantitative – Menguc and Barker (2005); Peteraf and Reed (2007); Benner (2009)

Implication relating to dynamic capabilities deployment in practice

Empirical evidence suggests that agency can play either a useful or obstructive role in the deployment of dynamic capabilities –how a particular change to the resource base fits with management schema may impact on deployment approaches.

Management/ leadership agency can determine both which changes and which approaches to change are ‘legitimate’. In uncertain environments or new situations, agency can also provide direction grounded in variation to the benefit of the organisation. By accepting a Helfatian definition of dynamic managerial capabilities, the purposive nature of deployment means that **managerial agency is argued to be a necessary factor**.

9 - Managerial Routines

Overview Theoretical Perspective

As argued in chapter 2, **routines** or patterned activity comprise at least part of dynamic capabilities as to qualify as a demonstrated capacity a dynamic capability has to be repeatable in some shape or form (Schreyögg and Kliesch-Eberl, 2007; Winter, 2003; O'Reilly III and Tushman, 2008; Zollo and Winter, 2002; Ambrosini and Bowman, 2009; Mathews, 2010). Ambrosini et al, (2009) and Ambrosini and Bowman (2009) propose that dynamic capabilities have an **ostensive** or structural component (which is relatively stable) and a **performative** aspect which represents the capability in practice – suggesting that dynamic capabilities encapsulate both a patterned and non-patterned element. Pandza and Thorpe (2009) note that the agency required for strategic sense-making in the face of change will never be patterned.

Thematic Empirical Evidence

Theme 9a – Dynamic capabilities have a routine component which makes them repeatable and can be beneficial in increasing the efficiency of deployment

Qualitative Evidence – D’Adderio (2001); Salvato (2003); O’Connor and DeMartino (2006); Witcher et al (2007); Anand et al (2009); Narayanan et al (2009); O’Reilly III et al (2009)

Quantitative Evidence – King and Tucci (2002); Lampel and Shamsie (2003); Newbert (2005); Benner (2009); Lopez-Mielgo et al (2009)

Theme 9b – Dynamic capabilities have a performative component grounded in agency which makes them flexible and adaptable to particular circumstances

Qualitative Evidence – Mosey (2005); O’Connor and DeMartino (2006); Witcher et al (2008); Salvato (2009)

Quantitative Evidence – Newbert (2005); Lopez-Mielgo et al (2009)

Implication relating to dynamic capabilities deployment in practice

There is much empirical evidence to support the theoretical view that for dynamic capabilities to be useful they need a routine aspect. Equally, further findings suggest that routine elements are accompanied by a ‘performative’ element, related to agency of the enacting manager (and therefore indirectly tied to managerial agency). As discussed in chapter 2, managers are argued to draw on **a contingent blend of routine and unpatterned activity** when deploying dynamic capabilities. Therefore, managerial routines are considered to be **necessary components** of the framework.

10 – The Business Environment and Market Conditions

Overview Theoretical Perspective

The modern business environment develops from a complex co-evolution of incumbent actions and external strategic industry factors (customers, competitors, suppliers, governments, institutions etc) (Augier and Teece, 2008, 2009; Amit and Schoemaker, 1993; Aragon-Correa and Sharma, 2003; Zahra, 1999; Wheeler, 2002; Wang and Ahmed, 2007). Related market conditions, characterised in terms of **uncertainty, complexity and munificence**, all have a profound impact on the form and function of dynamic capabilities (Lavie, 2006; Amit and Schoemaker, 1993).

Eisenhardt and Martin (2000) also describe the notion of market velocity (rate of factor change) as a boundary condition for the form of dynamic capabilities. In moderately dynamic markets, dynamic capabilities may have a high level of tacit knowledge embedded in them but in **high velocity environments**, dynamic capabilities are simpler and more experiential in nature although less sustainable. Managerial uncertainty in high velocity environments has an impact on dynamic

capabilities (Eisenhardt and Martin, 2000; Winter, 2003; Aragon-Correa and Sharma, 2003; Pandza and Thorpe, 2009). O'Connor, (2008) suggests that high uncertainty rather than high velocity is a more pressing consideration for describing environmental factors. In particular, whilst “hypercompetitive environments” may be threatening to managers, there is still a requirement to respond adequately to the change requirements they present (Barnett, 2005).

Thus dynamic capabilities have been thrust to the forefront of a competitiveness research agenda, a view echoed by Oliver and Holzinger (2008). Drawing on contingency theory, Aragon-Correa and Sharma (2003), Ambrosini and Bowman, (2009) and Judge and Blocker (2008) argue that alignment of internal resources with external conditions is critical in determining organisational success. However according to Zahra et al (2006), environmental effects may enhance the value of dynamic capabilities but are not essential components of dynamic capabilities.

Authors such as Zollo and Winter (2002), Teece (2007), Lee et al, (2002), Zott (2003), Easterby-Smith and Prieto (2008), Augier and Teece (2008), Oliver and Holzinger (2008), Ambrosini and Bowman (2009), Pandza and Thorpe (2009), Augier and Teece (2009) and Mathews (2003) propose that **scanning and search routines and processes** are key constituents of dynamic capabilities. Benner and Tushman (2003) suggest that process management techniques aimed at the efficient routinisation of organisational processes have an increasingly influential bearing on dynamic capabilities (potentially negatively in the form of variation reduction).

Thematic Empirical Evidence

Theme 10a – Environmental scanning mechanisms are essential parts of dynamic capabilities ability to align with the environment or create market change

Qualitative Evidence – Harreld et al (2007)

Quantitative Evidence – Danneels (2008); Pierce (2009)

Theme 10b – Firms must be able to respond to changes in external factors

Qualitative Evidence – Rosenbloom (2000); Aragon-Correa and Rubio-Lopez (2007); Pablo et al (2007)

Quantitative Evidence – Narasimhan et al (2006); Wu (2006,2007,2010); Ettlíe and Pavlou (2009); Sirmon and Hitt (2009)

Theme 10c – Environmental conditions may determine if and how dynamic capabilities are deployed

Qualitative Evidence – Athreye (2005); Wilson and Daniel (2006); Athreye et al (2009)

Quantitative Evidence – Pavlou and El Sawy (2006); Moliterno and Wiersema (2007); Peteraf and Reed (2007); Fang and Zhou (2009); Pierce (2009); Shamsie et al (2009)

Implication relating to dynamic capabilities deployment in practice

Empirical evidence suggests that **dynamic capabilities and the external environment of the firm are engaged in a contingent relationship** – firms need to be able to respond to change in the environment and change in the environment can determine the usefulness and the form of dynamic capabilities. Empirical studies also suggest the importance of scanning mechanisms in being able to effectively deploy dynamic capabilities in a reactive or even proactive way. However, market conditions do not necessarily contribute or impact the capacity to effect a resource base change and therefore must be considered extrinsic to the dynamic capabilities deployment practice framework.

11 - Business Architecture and Governance

Overview Theoretical Perspective

Business architecture/model and governance contribute to the ability of an organisation to learn, sense and seize opportunities and also to reconfigure its resources to defend threats and appropriate rents (Teece, 2007; O'Connor, 2008; Nelson, 1991; Bowman and Ambrosini, 2003; Pil and Cohen, 2006; Augier and Teece, 2008). According to Teece (2007, p1331) “No amount of good governance and leadership is likely to lead to success if the wrong business model is in place.”

Many authors argue for decentralised organisational structures and ‘near decomposability’ to maximise local decision making and responsiveness of firms (Teece, 2007; Pil and Cohen, 2006), effectively enabling ambidextrous approaches to balancing the simultaneous exploration and exploitation requirements of an adaptive system (Schreyögg and Kliesch-Eberl, 2007; O’Reilly III and Tushman, 2008; Benner and Tushman, 2003; Graetz and Smith, 2008; Judge and Blocker, 2008).

Managers need to apply dualistic approaches to balancing conflicting organisational demands such as exploration and exploitation (Benner and Tushman, 2003; O’Reilly III and Tushman, 2008).

Thematic Empirical Evidence

Theme 11a – Business architecture and governance has a major impact on how dynamic capabilities are deployed

Qualitative Evidence – Tripsas (1997); Galunic and Eisenhardt (2001); Rindova and Kotha (2001); Foss (2003); Gilbert (2006); Harreld et al (2007); Mathiassen and Vainio (2007)

Quantitative Evidence – Luo (2003); Karim (2006,2009)

Theme 11b - Organisational forms which take in external network resources change how dynamic capabilities are used

Qualitative Evidence – Smart et al (2007)

Quantitative Evidence – Lampel and Shamsie (2003); Song et al (2005); Newbert et al (2008); Sawyer et al (2008)

Theme 11c - Organisational forms and governance have to enable balance of the exploitation/exploration duality

Qualitative Evidence – Verona and Ravasi (2003); O’Reilly III et al (2009); Salvato (2009)

Quantitative Evidence – Capron and Mitchell (2009)

Implication relating to dynamic capabilities deployment in practice

Empirical evidence suggests that how dynamic capabilities are deployed in practice may be influenced by corporate architecture and governance in two ways. Firstly, organisational architecture and governance will determine what resources are

available to practising managers and secondly, organisational form and governance will provide structural conditions in which managers have to make decisions about how to balance current operations with change during the deployment of dynamic capabilities. However, as with many other factors in dynamic capabilities theorising, managerial agency and perception mean that these factors may be ignored without necessarily impacting the practice of change to the resource base. That is to say, whilst understanding architecture, governance and needs such as balancing exploitation and exploration might help managers make decisions which are more astute and beneficial in the long term, they are contingent to the actual practice of deploying dynamic capabilities. Therefore **organisational forms and governance are extrinsic** to the deployment framework.

12 - General Organisational Context

Overview Theoretical Perspective

Context is an overarching consideration in the deployment of dynamic capabilities. As Ambrosini et al (2009) suggest, dynamic capabilities are situated and the specific circumstances of the firm impact their development and deployment, a view shared by Zahra and George (2002b). Barreto (2010) proposes that the value of dynamic capabilities is context dependent. Zahra and George (2002a) propose that dynamic capabilities deployment may be triggered by internal crises or external events. Benner and Tushman (2003) and Oliver and Holzinger (2008) note that **institutional pressures** also have a major bearing on the form and function of dynamic capabilities – relatedly Chi and Seth (2009) and Dixon et al (2010) note that the country of origin or location of an organisation have a bearing on dynamic capabilities.

Thematic Empirical Evidence

Theme 12a - Dynamic capabilities have a role to play in managing the contingent fit/alignment of internal organisational and external factors

Qualitative Evidence – George (2005); Mosey (2005); Aragon-Correa and Rubio-Lopez (2007); Pablo et al (2007); Maklan and Knox (2009); Townsend et al (2010)

Quantitative Evidence – Griffith and Harvey (2001); Luo (2003); Slater et al (2006); Floricel and Ibanescu (2008); Laeequddin et al (2009); Zhou and Li (2010)

Theme 12b - Institutional factors can impact the deployment of dynamic capabilities

Qualitative Evidence – Salvato (2003); George (2005); Townsend et al (2010)

Quantitative Evidence – Lampel and Shamsie (2003); Luo (2003); Marcus and Anderson (2006); Benner (2009); Malik and Kotabe (2009); Sarkis et al (2010)

Implication relating to dynamic capabilities deployment in practice

Empirical evidence suggests that institutional pressures can exert influence on how dynamic capabilities are deployed and at the same time, dynamic capabilities can be shown to play a useful role in aligning internal factors with external contingencies. However, at the level of managerial practice, both internal and external context are argued to be out with the boundaries of the Helfatian definition of dynamic managerial capabilities with the exception of the engaged structure. That a firm can address further contextual concerns to its advantage through dynamic capabilities does not make them required components of deployment- managerial agency and perception ensures that contextual considerations can be ignored. Therefore, the **general organisational context is argued to be a contingent part** of the managerial level conceptual framework. However, developing the necessary component of theme 7 – structural engagement - the **views of the engaged structure are argued to be a necessary component.**

13 - Organisational Social Capital and Network Positions

Overview Theoretical Perspective

The **structural social capital** of a firm and its members in various business networks is suggested to have a major bearing on how dynamic capabilities are formed and deployed (Blyler and Coff, 2003; Easterby-Smith and Prieto, 2008; Oliver and Holzinger, 2008; Möller and Svahn, 2006). Blyler and Coff (2003) suggest that structural social capital is a necessary but insufficient condition for dynamic capabilities development. Ng (2007) and Hart and Sharma (2004) propose that the

loose ties a firm maintains with a wide range of organisations and stakeholders can act as a source of diversity/variation for change opportunities. Lichtenthaler and Lichtenthaler (2009) argue that open innovation is increasingly making the knowledge resources of different firms available to each other.

Thematic Empirical Evidence

Theme 13a - Social capital/relational capabilities enable managers to attract and utilise external resources during the deployment of dynamic capabilities

Qualitative Evidence – Pandza et al (2003a); Blomqvist et al (2004); Newey and Zahra (2009)

Quantitative Evidence – Wu (2006); Rothaermal and Hess (2007); Newbert et al (2008); Vaidyanathan and Devaraj (2008); Aggarwal and Selen (2009); Ettlie and Pavlou (2009)

Theme 13b - Firms need to invest time and energy in developing relationships/network positions in order to exploit external resources when needed

Qualitative Evidence – Madhok and Osegowitsch (2000)

Quantitative Evidence – Chang (2003); Jarratt (2008); Laeequddin et al (2009)

Implication relating to dynamic capabilities deployment in practice

Empirical evidence suggests that managers may need to draw on social capital and relational capabilities if they wish to exploit external resources – these take time to establish and as such, daily activities of managers might contribute incrementally to the creation of such resources/capabilities over a period of time. However, as with internal resources, the leverage of social capital and network position is not mandatory to the practice of deploying dynamic capabilities and therefore **social capital and network position are extrinsic** to the deployment framework.

Summary of Detailed Review Findings

The critical analysis conducted in the previous section identified elements from extant literature which are argued to be necessary components of a dynamic managerial capabilities deployment practice. These factors are summarised in Table 3.2.

Category	Necessary Factors	Contingent Factors
1. Learning	Experiential learning outcomes	Deliberate learning mechanisms
2. Knowledge		Stocks Flows
3. History / Path Dependence	Previous Paths	
4. Cospecialisation, Complementarities and Resource Bundles		Resource Bundles
5. Management Resource	Managerial Attention/Energy	
6. Human Aspects of Management	Managerial Perceptions	Managerial System
7. Structural Engagement	Structural Engagement	
8. Managerial Agency	Managerial Agency	External (corporate HQ) managerial agency
9. Managerial Routines	Managerial Routines	
10. External Environment		External Environment
11. Business Architecture and Governance		Organisational form Governance
12. General Organisational Context	Structural Views	Organisational Context
13. Structural Social Capital		Social capital Network position

Table 3.2 – Summary of Necessary and Contingent Factors Influencing the Deployment of Dynamic Managerial Capabilities

Shaping the Conceptual Framework

Based on the findings of the in depth review of literature, diagram 3.4 below is suggested as a conceptual framework describing the deployment of dynamic managerial capabilities in practice. The numbers contained in the boxes correspond to the category numbers in table 3.2.

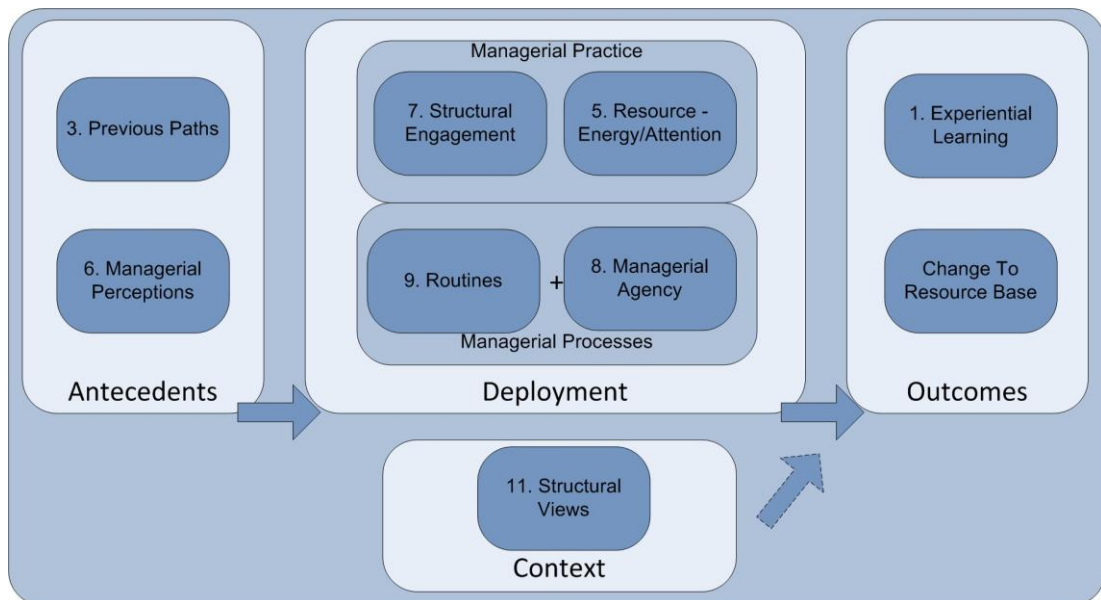


Diagram 3.4 Conceptual Framework of Deployment of Dynamic Managerial Capabilities

This framework is presented in terms of antecedents, deployment, outcomes and context. **Antecedents** provide a channel to feed in both experiential learning and outcomes of previous deployments. Furthermore, the managerial perceptions factor recognises that dynamic managerial capabilities will be deployed in response to managerial interpretation of circumstances (which may not be objective).

Within the **deployment** phase routines and managerial agency are linked in that they reflect the managerial processes available according to the characteristics of the instigating manager (e.g. human capital, social capital and mental models according to Adner and Helfat(2003)). The plus symbol is intended to emphasise that each time dynamic managerial capabilities are deployed, a contingent blend of managerial routine and agency defines the managerial processes used. In chapter 2, processes

were defined as collections of routine and non-routine activities by which dynamic capabilities are put into practice. Two main characteristics of deployment practice - structural engagement and managerial resource (energy/attention) - are identified from literatures which describe how the activities of the managerial processes are enacted. At this stage no further relational inferences are made between structural engagement and resource factors. Instead, through analysis of empirical evidence, tentative relationships will be suggested in later chapters.

Context in the form of the engaged structure's views is portrayed as an element out with the control of the manager but nonetheless a necessary part of deployment. The dotted line of the arrow linking it in to the flow of activity is intended to represent the potential for the structural view to help or hinder deployment.

By way of **outcomes**, as argued earlier in this chapter, the act of deployment of dynamic managerial capabilities is shown to necessarily generate experiential learning (however slight) for the instigating manager. Also included is the unnumbered outcome of a "change to the resource base". This is for two reasons – by definition (as described in chapter 2), dynamic capabilities are concerned with change; furthermore, *throughout* categories 1 to 13 the view is extolled that deployment of dynamic capabilities at any level will create some form of change to the resource base. What is not inferred however is the nature of the outcome - the change as realised may not be as intended.

For clarity, whilst extant literature makes clear inferences about likely relationships and influences between contingent factors, any such relationships are now considered to be beyond the scope of this thesis (and hence the reason some of the main themes are not represented in the conceptual framework).

At the outset of this chapter, Whetten's (1989) view was cited that a balance of comprehensiveness and parsimony was required in the identification of elements of a conceptual framework. It is argued that the approach adopted in this thesis was comprehensive and followed a clearly described process, albeit the outcomes are

based on the subjective interpretations of the author. Equally, the resultant conceptual framework is argued to be parsimonious as it provides a manager-centric, practice-oriented view of deployment based on necessary rather than contingent factors.

The framework presented in diagram 3.4 could be considered an idiosyncratic output of the author's views and interpretations in combination with the structured approaches described in chapters 2 and 3. It is recognised that many alternative conceptual frameworks could be generated by different researchers, with equally valid claims as representations of the deployment of dynamic managerial capabilities. Chapter 7 offers critical reflection, refinement based on findings and discussion about the implications of the particular model adopted in this thesis.

Research Sub-Questions

The conceptual model represented in diagram 3.4 represents a framework which can support the empirical investigation of the revised research question – “How are dynamic managerial capabilities deployed in practice?” To provide direction as to how this might be done, a number of further research sub-questions can be posed based on the discussions and findings of chapters 2 and 3.

Sub-question 1 - How do the necessary factors of dynamic managerial capabilities deployment affect purposeful change to the resource base?

Focusing on the deployment of managerial resource, this question is intended to examine how the factors identified in the conceptual framework impact (individually and in combination) intended changes to the resource base. The question is detached from the notion of organisational performance – it is concerned solely with attempts to deliver tangible, intangible or human resource change to the resource base of the firm (as recommended by Lillis and Lane (2007) for the study of dynamic capabilities deployment over time). As suggested by George (2005), successful and unsuccessful attempts at resource base change will be examined to avoid issues of tautology. However, intentionality is an important consideration in examining dynamic capabilities so whether or not the outcome was as intended will be gauged

Sub-question 2 - How do sequential deployments of dynamic managerial capabilities interact?

Where changes are made through dynamic managerial capabilities which contribute towards a shared organisational level change event, this question will examine how sequential deployments of dynamic capabilities might influence each other through experiential learning and resource change effects.

Sub-question 3 - How do concurrent deployments of dynamic managerial capabilities influence each other?

When the same manager attempts concurrent changes to the resource base, this question addresses the components of deployment practice – is there any cross over and influence between change efforts? If so, how are the different elements of deployment practice affected?

Separately and in combination, propositions addressing these research sub-questions will allow empirical evidence to be developed into theorising which may contribute to understanding of how dynamic managerial capabilities are deployed in practice. The following chapter will outline a methodology for obtaining the requisite empirical evidence.

Chapter 4 - Methodology

“A critical methodology should not restrict science to a narrow path that is only appropriate to a minority of studies. The variety of possible objects of study in social science stretches beyond the scope of a single model of research. Therefore, different methods can be combined to meet social science research needs depending on circumstances.”

Andrew Sayer, 1992 p4

Chapter Abstract

This chapter aims to develop an appropriate research design to allow robust qualitative investigation of the sub-research questions based on the conceptual framework identified in chapter 3.

Methodology is defined as a system of methods. Dynamic capabilities literature is drawn on to identify appropriate methods to be used in combination in the investigation of the micro-process of dynamic capabilities deployment at a managerial level. For data collection, a range of methods associated with longitudinal qualitative case studies are identified. This includes participant observation through action research (treating action research as a method). For data analysis, a combination of quasi-statistics, chronological mapping and interpretative techniques are suggested under the broad heading of an explanation building analytical strategy.

The research context is briefly introduced to justify these approaches and matters of validity and generalisability are discussed. A visual representation of the overall research design is proposed based on Maxwell's (2005) view. Finally, prior to exposition of the research findings, targeted contributions to theory and practice are nominated based on the content of the thesis thus far. These outputs are offered as both a guide to the structure of the second half of the thesis and a foundation for discussion of the findings.

Introduction

The aim of this chapter is to describe and explain the empirical methods used to address the research questions identified at the conclusion of chapter 3. To achieve this aim, foundational terminology and concepts are first defined before the research context is revealed and data collection and analysis approaches are proposed. In keeping with the views of Sayer (1992) highlighted above, the methods selected are designed around the nature of the research questions and a critical supporting argument for their selection is built.

Foundational Terms

Methodology

The review of dynamic capabilities empirical literature suggests that different authors use the term methodology to mean different things. Rather than critically assess the different possible interpretations (see Silverman (2003, p15)) for a useful typology), the definition of methodology adopted in this thesis and supporting rationale is described below in order that the reader might judge for themselves its appropriateness in light of the overall research aims.

“Methodology is defined as a system of methods and rules to facilitate the collection and analysis of data.” (Hart, 1997, p28).

Functionally, this definition clearly states that methodology enables the collection and analysis of data. Furthermore, it sets methodology as a meta-construct comprised of **methods**, which are particular techniques of data collection and analysis, and **rules** which are principles of practice. Different methods inform the researcher about different, particular aspects of reality and their selection is largely a practical matter (Sayer, 1992). It is wholly possible to apply methods inappropriately or inaccurately and each method has inherent strengths and weaknesses. Methodology should also facilitate adaption of approach as required by conditions during fieldwork. Consistent with the views of Cresswell and Plano Clark (2007), rules are therefore taken to mean useful, transparent guidelines, rather than rigid restrictions.

Using a system of methods – a methodology – is a way in which we can account for the limitations of individual methods when inquiring of the world and hopefully conduct flawed research in an acceptable and reasonable manner (McGrath, 1981). According to Silverman (2003), methodology may also be defined in broad terms – as qualitative, mixed or quantitative in orientation – or narrow terms, relating to more specific sets of methods such as grounded theory or conversation analysis. Using these terms, the methodology adopted in this thesis might broadly be described as qualitative and more narrowly is argued to align with a longitudinal cross-case study approach. However, such high level descriptions require elaboration as within the longitudinal cross-case study is embedded a mix of participative, observational and historical methods. It is critical to the integrity of this thesis that these methods are made explicit as their use in combination provides the data which is foundational to the outcomes and arguments of later chapters.

Research Design

Methodology is closely related to the notion of **research design** which, according to Maxwell (2005), refers to our plan for conducting a specific piece of research. Necessarily, this involves making choices about a range of criteria relating to what we study (our object of research and our research questions), how we study it (our methodology and methods) and our objectives (contribution to knowledge and practice) (Easterby-Smith et al, 2002). Our research design choices are heavily influenced by our philosophical position (ie. the combined effects of our ontology and epistemology) although matters of politics, opportunity and researcher skills also come into play (Easterby-Smith et al, 2002). In qualitative research, it is argued that research design should adapt as inquiry progresses, taking the form of a “reflexive process operating through every stage of the project” (Hammersley and Atkinson, 1995, p5, in Maxwell, 2005). Therefore, when we initiate an inquiry, we can shape its general direction based on what we know at the time, but the research design has to be contingent and adaptive ongoing in light of emergent findings (Miles and Huberman, 1994; Easterby-Smith et al, 2002; Maxwell, 2005).

Sayer (1992, 2000) proposes that there are two archetypal research designs, intensive and extensive, which can be aligned with different methodological types from a critical realist perspective (see appendix 4.1 for a table of comparison). Sayer explains (2000, p20)

“An intensive approach to social science research would start with individuals and trace the main causal relationships into which they enter and study their qualitative nature as well as their number. It might not be possible to define these causal groups at the outset of the research, indeed discovering them and studying how they operate might be a key component or objective of the research. As the name suggests, extensive research shows us mainly how extensive certain phenomena and patterns are in a population.”

Based on the research questions developed so far and the stated interests of the author, it is argued that the research design adopted in this thesis will mainly align with an intensive research design template. The individuals examined in the deployment of dynamic managerial capabilities will be managers and their activities in practice will be qualitatively analysed.

Intensive research designs have been commented on by a number of authors including Tsoukas (1989); Easton (2000); Costello (2000), Coopey et al (2000); Tsang and Kwan (1999); Sayer (1992,2000). They share the views that intensive research designs are typically qualitative studies aimed at explaining why and how phenomena occur. They usually occur within a single or small number of organisations with a unit of analysis typically being specific events or individuals – the sample size is a practical matter relating to the length of time and amount of effort it takes to conduct intensive research. These views align with the primary level and unit of analysis selected in this study.

The same authors also suggest that intensive research designs trace the main causal relationships of the unit of analysis, studying their qualitative nature and influences. Intensive designs are criticised as being limited in that actual concrete patterns and contingent relations are unlikely to be representative, average or generalisable.

However, it will be argued in this chapter that analytical generalisability can be achieved if objects in the real domain are identified and characterised. Intensive research incorporates triangulation and corroboration efforts by way of validity testing and typically will conduct two streams of inquiry simultaneously - theoretical abstraction and a practical examination of the empirical.

If the initial chapters of this thesis identified what was to be studied, then the explication of methodology in this chapter is intended to illuminate how the deployment of dynamic managerial capabilities in practice is to be empirically investigated. In so doing, dynamic capabilities literature is drawn on for guidance about how to proceed.

Researching Dynamic Managerial Capabilities

As suggested by Maxwell (2005), research design should incorporate considerations from current literature (amongst other factors). Consequently, in selecting appropriate research methods, it is possible to draw on extant dynamic capabilities literature views on how the topic of the deployment in practice of dynamic managerial capabilities should be investigated.

Literature Views – What Should be Done?

Ambrosini and Bowman (2009) advocate that qualitative, smaller sample studies are likely to be more appropriate for understanding the subtlety of resource creation and regeneration processes and Pandza et al, (2003a, p826) argue that the “complex, path-dependent and ill-structured” nature of dynamic capabilities deployment demands “in-depth qualitative work within a small number of organisations” to generate meaningful insights. Easterby-Smith et al (2009, pS6) further propose that such qualitative studies might provide “detailed descriptions of what processes are involved, the role of management, the reconfiguration of the dynamic capabilities, and the interaction with the environment”.

Ambrosini and Bowman (2009, p37) also suggest that understanding of practice “requires fine grained investigations to obtain rich and contextualized data” – noting however that such qualitative fieldwork is typically time consuming and demanding

in terms of funding, access to firms and analysis. Regnér (2008, p571) strongly advocates practice research which focuses on “how social mechanisms involving actors, activities and artefacts may develop and change organizational assets”. Regnér (2008, p571) also suggests that a practice approach may "assist in uncovering micro-foundational mechanisms underlying the organizational-level construct ‘capabilities’”. Salvato (2009), D’Adderio (2001) and Pablo et al (2007) all advocate research approaches which develop an in depth understanding of the micro-processes, day-to-day events and managerial intentionality which underpin practice.

Aragon-Correa and Sharma (2003, p84) argue for “longitudinal process-based studies” to shed light on how managers deploy dynamic capabilities and Newey and Zahra (2009) and Zahra and George (2002a) suggest that such process research may uncover generative mechanisms. This view is evident in empirical research as exemplified by authors such as Bruni and Verona (2009); Rindova and Kotha (2001); Witcher et al (2008); Salvato, (2003, 2009); Butler and Murphy, (2008).

Literature Views- How Should it be Done?

Maklan and Knox (2009, p1397) suggest that “As dynamic capabilities are highly context specific and grounded in tacit knowledge, identifying and understanding them requires enquiry from within the firm”, advocating action research methods as a means by which to do so.

Action Research Methods

Reason and Bradbury (2006, p1) propose that action research is “a participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes, grounded in a participatory world view”. According to Eden and Huxham (1996), action research requires the academic to intervene over a matter of genuine concern to the organisation. Coughlan and Coughlan (2002, p220) suggest that action research is “about taking action and creating knowledge or theory about that action.”

Action research also requires the academic to immerse themselves in an extra-academic context to aid achievement of a goal of the host organisation (Easterby-

Smith et al, 2002; Blomqvist et al, 2004). This typically requires the academic to contribute specific knowledge not resident in the organisation's resource base, which may equally refer to technical know-how or critical reflective approaches for developing deep 'conceptual' insights (Maklan and Knox, 2009). As distinct from straightforward consultancy, the academic also has to be able to sense the potential for making a contribution to knowledge based on their dealings with the organisation to justifiably refer to their intervention as action research (Checkland and Holwell, 1998; Gummesson, 2000; Easterby-Smith et al, 2002; Eden and Huxham, 2002).

Action Research Methods and Dynamic Capabilities Research

In meeting the need to 'enquire from within the firm', Salvato (2009), D'Adderio (2001), Blomqvist et al (2004), Pandza et al (2003a) and Butler and Murphy (2008) join Maklan and Knox (2009) in demonstrating the use of action research as a form of participatory enquiry which provides the authors with deep insights into the day to day running of the organisation over a sustained period of time.

Salvato, (2009, p385) suggests that the benefit of action research methods is that they provide a mechanism for "reducing grain size to include everyday actions performed by individuals in and around the organization". Blomqvist et al (2004, p592) further suggest that "where the researchers act not only as researchers but also actively participate in the business the combination of the inside and outside views enables a deeper understanding" of daily organisational complexities, challenges and practices. McNiff and Whitehead (2006, p256) suggest that action research is "a form of research that enables practitioners to learn how they can improve practice, individually and collectively." – an important perspective given the practice and practitioner influenced aims outlined in chapter 1.

Challenges in using Action Research Methods for Dynamic Capabilities Research

Consistent with the views of Ambrosini and Bowman (2009), one of the main barriers to engaging in action research is its time-intensive nature (Eden and Huxham, 2002). Action research is appropriate for understanding events unfolding over time in an organisation and the factors which affect the outcome achieved. (Checkland and Holwell, 1998; Coughlan and Coughlan, 2002). On a practical level,

to facilitate action research, the academic needs to find (1) a justification for their involvement (2) an appropriate organisational context where they can contribute AND there exists the opportunity to participate in the management of a particular organisational phenomena which aligns with their research interests (Gummesson, 2000; Eden and Huxham, 1996, 2002).

Relevance for this thesis

Action research as a method appears to be a relevant data collection option for this study given the managerial level of an analysis and a stated interest in understanding the micro-processes of dynamic managerial capabilities deployment. In particular, it seems to offer the potential to gather the fine grained, contextualised data advocated by Ambrosini and Bowman (2009) as essential to developing understanding of dynamic capabilities in practice. Equally apparent however are the significant practical challenges in arranging the access and resource necessary to use action research methods. These matters will be addressed in the ‘Research Context’ section later in this chapter before confirming action research method as a viable option for data collection.

Longitudinal Case Study Methods

Yin (2003, p13) refers to a case study as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident”.

Case study involves an in depth investigation over time of one or a small number of organisations to understand a phenomena in context (Yin, 2003; Easterby-Smith et al 2002; Dobson 2001). Case studies are well suited to investigating processes of change over time (Van de Ven, 1992; Dobson, 2001) and use both qualitative and quantitative data (Yin, 2003). In social science, case methodology can be argued to be either similar to quasi-experimental methods or action research (Easton, 2000; Easterby-Smith et al, 2002). Case studies can be described as an interpretive method and when conducted will be contextualised to specific cases but can be related to the general through analytic generalisation (which relates findings to theories rather than populations)(Dobson, 2001). Care must be taken when conducting case studies to

retain the context of data sources (by constantly referring to them). Case research is normally associated with 'how and why' style research questions in studies conducted over time. It is argued that case studies can cover a very wide range of approaches from mechanistic, positivistic approaches to highly interpretive, subjective studies (Yin, 2003; Stake, 1995,2000).

Based on the combination of these views from literature, case study research appears to be appropriate to the needs of this study. Furthermore, it appears that case study research aligns with an intensive research design and has the potential to create analytically generalisable findings.

By precedent, extant dynamic capabilities literature appears to confirm the suitability of a case based approach (although case study is a broad phrase covering myriad combinations of methods and examples abound of quite divergent approaches being employed). The qualitative empirical work reviewed in appendix 3.1 is split approximately 50:50 in terms of single firm or multiple firm cross-case studies. The actual methods used to research contemporary phenomena within real life contexts cover a wide range such as highly structured, positivistic approaches (e.g. (O'Connor and DeMartino, 2006; Harris et al, 2009); semi-structured key informant interviews and triangulation with observation and documentary/secondary data sources (Newey and Zahra, 2009, Pandza et al, 2003a; Mosey, 2005; Anand et al, 2009; Holweg and Pil, 2008; Gilbert, 2006; Townsend et al, 2010; Lee and Kelley, 2008; Pablo et al, 2007; Verona and Ravasi, 2003); retrospective ethnographic methods (Witcher, 2008); grounded approach – constant comparison and inductive theorising (Wilson and Daniel, 2007; MacCormack and Iansiti, 2009; Verona and Ravasi, 2003) and historical approaches comprising archival analysis and retrospective interviews (e.g Rosenbloom (2000), Taylor and Helfat (2009), MacCormack and Iansiti , 2009, Buenstorf and Murmann, 2005, Lazonick and Prencipe, 2005, Tripsas, 1997).

These examples suggest that case study methods are appropriate for use in empirically investigating dynamic capabilities. Furthermore, the broad range of methods used under a case study heading suggest that it is permissible to match

methods to circumstances. Therefore, before identifying specific methods for investigating the practice of dynamic managerial capabilities deployment, the research context is described on the basis that it should influence the choices made.

Research Context

The context for empirical research in this thesis has been provided by the author's engagement with two organisations in programmes of action research backed by the Knowledge Transfer Partnership (KTP) scheme - a UK wide initiative designed to encourage business and academic collaboration. Funded primarily by the UK government through the Technology Strategy Board, an industry led research group, individual programmes require the formation of a partnership between an academic institute and an organisation seeking to engage in a specific form of change. To establish a KTP, a proposal is jointly drafted by the collaborating partners, specifying the business and academic outputs to be achieved. If accepted, KTP funding covers both the cost of weekly intervention with the organisation from a lead academic and the hiring of an additional research associate to act as a full time resource for change in the organisation.

The KTP context is important to acknowledge as it could be argued that the structure of the programme forces the use of action research methods in this study. According to Dr Gerry Black (2008, in meeting), the lead KTP administrator for Scotland, KTP partnerships necessarily require an 'action research' approach from academic partners in order to deliver specific business outputs. In Dr Black's view, KTP partnerships implicitly result in knowledge transfer from academia into an organisation but equally, practical research outcomes emerge which can be harvested by the academic partner. From a researcher's perspective, in return for regular and effectively unlimited access to the organisation, a participatory approach must be adopted to assist in the delivery of organisational objectives.

It is argued that any implication of methodological bias related to this requirement is a non-issue in this thesis. Firstly, a participative approach aligns with the needs of the research question and also researcher preferences. Secondly, the participatory approach need only be applied to delivering outcomes specified in the research

contract – there is no reason why other methods cannot be used to develop understanding of the same or other aspects of the organisation concurrently. In fact, from an academic perspective, there is much to commend KTP as a means by which practical barriers to conducting fine-grained research can be overcome. Apart from securing financial support and ring-fencing time for research for the academic, drafting the KTP proposal allows both partners to establish pre-understanding and a working relationship whilst testing the possibility of attaining all stakeholder goals through the one project.

This thesis is informed by evidence collected during programmes of action research with two Scottish construction industry firms between 1st July 2008 and 31st December 2009. One firm, Architectural Glazing Systems (AGS) Ltd¹⁰, is a small enterprise of 21 permanent staff formed in 2004 whereas the other, Solway Structural Steel and Precast Concrete¹¹ is an organisation of scale (c.200 employees) with an established history and the backing of a larger privately owned firm, Trench Holdings (c.1000 employees). Despite these differences, the close location, private ownership and local market focus of both firms (Scotland) means that they draw from the same human resource pool and have similar cultural influences.

In both cases, the business partners were seeking to renew their approach to information management through the implementation of integrated business systems (albeit motivated by different espoused reasoning). At the same time, both were seeking to use this initial strategic project as a springboard into long-term modifications to work practices throughout the business as well as making minor adjustments to existing processes. From undergraduate studies, practical experience and continuing professional development, the author was identified by the KTP organisation as having an appropriate skill set to be able to engage with the organisations in pursuit of their stated goals. The timing and the nature of the KTP engagement was opportune for the author who was seeking interventions of appropriate scope and scale for doctoral data collection.

¹⁰ Referred to forthwith as AGS

¹¹ Referred to forthwith as Solway

The events encountered are relayed in summary in the next chapter as a precursor to the presentation of research findings. With the research context outlined, the following section describes the data collection and analysis approaches selected.

Methods Adopted

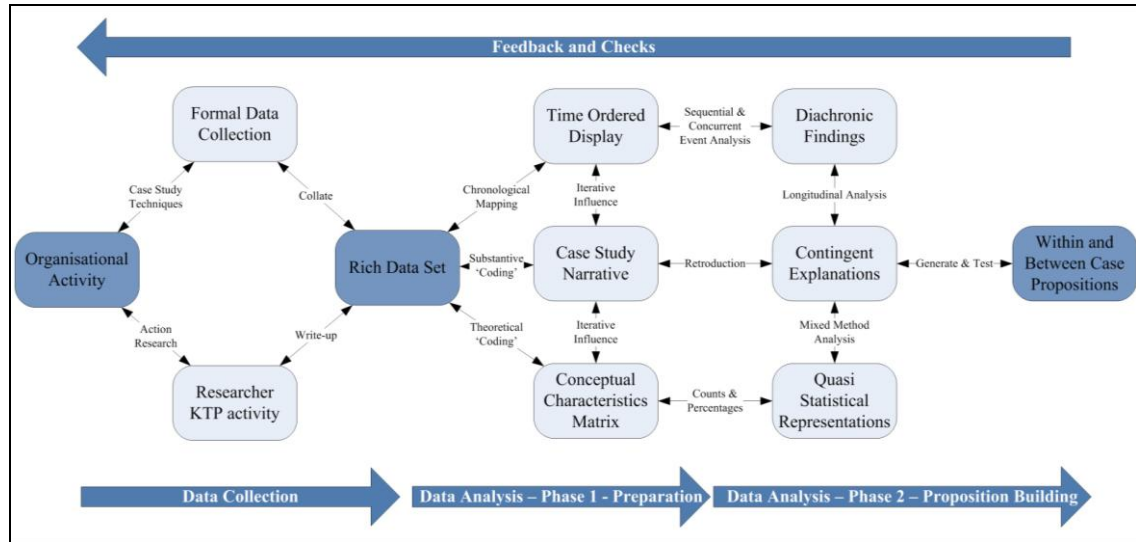


Diagram 4.1 –Overview of Methodology

Diagram 4.1 presents a summary of the methods adopted to generate research findings in this thesis. The boxes represent outcomes and the arrowed lines represent activities. The arrows are double headed in recognition of the iterative nature of the empirical investigation in both data collection and analysis – reflection on an outcome achieved by an activity would often trigger a reanalysis of the previous source outcome, consistent with expectations set by Janesick (2000)

In line with the discussions earlier in this chapter, data collection draws on formal methods associated with case studies as well as participatory data from the researcher’s experience engaging with the case study companies through KTP-backed action research. Data analysis is split into two phases – preparation and proposition building. In the preparation phase, a first pass at organising analysis in the form of chronological, substantive and theoretical coding (Maxwell, 2005) is carried out on the rich data set. The second phase of analysis further considers this

derived data in addition to the original rich data in order to generate a set of propositions about how dynamic managerial capabilities are deployed in practice. These propositions can be aligned with the initial research sub-questions in order to build understanding and explanation. The top arrow indicates that feedback from members of AGS and Solway on 'work in progress' was regularly sought and constant referral to the existing data set was carried out. These measures were deployed as an attempt to guard against researcher bias and to keep the empirical findings as close to actual events as possible.

Whilst containing action research data collection methods and a quantitatively oriented analysis tool in the form of quasi-statistics, it is argued that the system of methods represented in diagram 4.1 aligns with an explanation building qualitative case study approach. This argument is developed further in the following sections which explain the detail of the methods adopted and discuss the relative strengths and weaknesses of each.

Data Collection

According to Yin (2003) and Tharenou et al, (2007), case-based research can use both qualitative and quantitative data depending on the intended purpose of the study. In conducting case studies, Yin (2003, p100) suggests that data can be collected principally from six distinct sources.

- (1) Documents (any media relating to on-going practice within an organisation)
- (2) Archival records (formal records and external data sources)
- (3) Interviews (structured or unstructured discussions with actors)
- (4) Direct observation (non-participatory observation of the phenomena of interest or its context)
- (5) Participant observation (active involvement of the researcher in the phenomena of interest within its context)
- (6) Artefacts (inspection of the physical context or result of the phenomena)

As highlighted earlier in this chapter, the principle adopted for data collection in this thesis is that the methods used should be determined by the object of research, the research questions and opportunities as they presented themselves as empirical

events. In the context of an intensive research design conducting longitudinal case research on the subject of managerial practice, it was conceivable to the author that all six types of method might be called upon at some point during the study depending on the involvement of the researcher in the phenomenon of interest. In particular, it seemed that time-consuming and difficult to obtain participant observation (through the KTP ‘action research’ requirement) would be available as a potential data source. This was seen as an advantage given the previously discussed views of authors such as Maklan and Knox (2009) and Salvato (2003, 2009).

As events unfolded, three main clusters of case study data collection approaches emerged based on the timing and involvement of the researcher in different “attempted purposeful strategic changes to the resource base.” These are described in table 4.1 below under the headings of “participative” events where the author was actively involved in an intended change (as an external resource); “observational” events where the author was engaged with the organisation at the time of the event but not directly involved and “historical” events which occurred prior to engagement with the organisation by the author but were described in detail through interview and the effects could be observed from other data sources.

Source	Participative	Observational	Historical
Documents	√	√	√
Archival Records	√	√	√
Interviews	√	√	√√
Participant Observation	√√		
Direct Observation	√	√√	
Artefacts	√	√	√

√ = source used; √√ = principal source

Table 4.1 – Data Collection4 Methods

Table 4.1 shows that depending on the circumstances of the events under investigation, different sets of methods were used to collect data. The principal source indicated for each type of event is highlighted to inform the reader of the

dominant mechanisms used according to event type. This is deemed useful as a transparency measure as the events for which participant observation was the principle source will have arguably a greater degree of insight into actual managerial activity than observational or historical events (Janesick, 2000). Equally, historical events, relying more heavily on interviews, might be argued to be subject to interviewee bias (Sayer, 1992). However, as a whole it is argued that the variety of approaches is actually a useful feature of the research design, as shall be discussed at the end of this chapter.

When formal data collection mechanisms were used such as interviews and documentary analysis, findings were collated in a coherent, time ordered fashion by case context. As suggested by Kemmis and McTaggart, (2000) participatory data was recorded at the time in written format and where possible (given that formal mechanisms recorded cases in which the researcher did not participate) collated with findings garnered from formal mechanisms.

The data collection methods result in a voluminous rich data set combining primary and secondary data sources. As such, an initial challenge for analysis was to thin the data in light of the aims of the research (Miles and Huberman, 1994).

Data Analysis

The analysis of data in a qualitative study can be conducted through myriad techniques and approaches (Ryan and Bernard, 2000). Yin (2003) suggests that an overarching strategy or approach should be identified to lead researchers through data analysis at least in a semi-structured way as the appropriate techniques to deploy may not become apparent until data is collected.

The data analysis strategy of this thesis, consistent with the critical realist philosophy, data collection methods, research design, research questions and goals is one of “explanation building”. Rather than being a single technique, analysis is conducted in phases to build up an explanation, in a coherent manner, of the cases under investigation. As represented in diagram 4.1 and based on Miles and Huberman’s (1994, p56) assertion that “coding is analysis” Stage 1 pares down and

organises the rich case data through coding approaches. Subsequently, the second phase applies interpretative techniques to develop implications and propositions intended to address the research sub-questions. The phases are now described.

Phase 1

The rich data was initially analysed in three different ways. Firstly, change events were organised chronologically and visually depicted on a time ordered display. As suggested by Miles and Huberman (1994, p110), “Life is chronology. We live in a flow of events” and visually depicting the sequence of events as they happen is an important initial step in making sense of data. However, Miles and Huberman (1994, p111) also note that “narratives are probably indispensable if we are to understand a complex chronology in its full richness”. Consequently, a detailed write-up of the selected cases is presented in line with what Maxwell (2005, p97) describes as substantive coding. According to Maxwell (2005), substantive coding is primarily descriptive, retelling events in the researcher’s terms whilst drawing on the observed and espoused activities of actors. The aim of substantive coding is to start to provide a structure which doesn’t depend on theory but aids the development of theory. Finally, the conceptual framework is used as a scaffold to structure analysis (as recommended by Dobson (2001)). This involves abstraction and the necessary factors identified in the conceptual framework provide the categories.

To operationalise the conceptual framework for the theoretical coding activity, findings from the structured literature review were used to identify relevant category coding options which are explained below. In addition, when attempting to apply the conceptual framework, the researcher benefited from including further coding categories to help structure the data. These categories were identified through trial and error during initial coding efforts and their inclusion was purely for practical reasons – when making coding decisions, having related contextual information helped the researcher make consistent choices. This is consistent with Miles and Huberman’s (1994, p61) view that “For all approaches to coding, codes will change and develop as field experience continues”. The categories are left in the

operationalised framework presented in diagram 4.2. (on page 112) to fully inform the reader of the approach taken.

Not all factors in the conceptual framework were used during theoretical coding and the previous paths, managerial perceptions and experiential learning outcomes are not represented. Instead, the flow of events representing (near history) previous paths and experiential learning outcomes are captured in the time ordered display and managerial perceptions are captured in rich form in the structured case study narrative.

The aim with the theoretical coding categories, as recommended by Davies et al (2003), is to provide as few options as is feasibly possible in order to improve the repeatability of coding. In other words, where it was feasible to usefully do so, a dichotomous choice was presented in coding options (e.g. yes or no; high or low).

Coding options

The category coding options are explained below. In addition, a coding document was used to support the researcher throughout the coding effort (see appendix 4.2). It makes clear the meaning associated with each coding option, as recommended by Miles and Huberman (1994), and was frequently referred to throughout the coding activity as a decision aid.

As suggested above, the categories are mainly derived from the conceptual framework and the category options from the theoretical map. The clarity of outcome descriptor was included given that a common field observation was that a manager would instigate a change event without full clarity of the outcome to be achieved. For example, seeking to set up a shop floor quality management system (e.g. AGS case 3.m) was initiated with an initially low level of clarity of output – there were multiple ways in which this change could be enacted. By contrast, when purchasing EFACS (e.g. AGS case 1.c) there was a high level of clarity at the outset as to the form of the intended change to the resource base.

Furthermore, based on the field observation (discussed further in chapter 5) that the managers seeking to make purposeful change would alter how they acted depending on the structure with which they were engaging, a ‘structure type’ category was added. Initially, this was set up with internal and external category choices and further developed once coding commenced based on field observations.

Meta Category	Category	Category Options
Intended Change	Resource Type	TANGIBLE INTANGIBLE HUMAN
	Change Type	ADD DELETE MODIFY EXTEND
	Outcome Clarity	HIGH LOW
Deployment Practice	Managerial Processes	ROUTINE -BIAS NON-ROUTINE-BIAS BALANCED
	Managerial Energy	HIGH LOW
	Managerial Engagement	HIGH LOW
Structural Context	Structure Type	EXTERNAL MANAGERIAL INTERNAL ALL INT
	Structure View	FOR AGAINST AGNOSTIC
Outcome	Outcome As Intended	YES NO

Table 4.2 – Theoretical Coding Categories

Deployment practice factors are described in terms of managerial characteristics and managerial resource. Managerial characteristics are described by one entry with three options to describe the mix of routine and non-routine approach components (routine-biased, non-routine biased and balanced). As argued in the description of the conceptual framework in chapter 3, this reflects the notion that the deployment of

dynamic managerial capabilities always contains a blend of patterned and non-patterned approach as determined by the characteristics of the manager versus the needs of the situation. Managerial resource is described by two high/low entries to reflect the level of energy/attention dedicated by the instigating manager to the event and the level of engagement of the manager with the affected structure.

Finally, the structural context is described in terms of the engaged structured type and the structure's inherent view of the proposed change. The options for the engaged structure emerged from and the view of the organisation was revised to include an agnostic perspective based on rich data from AGS.

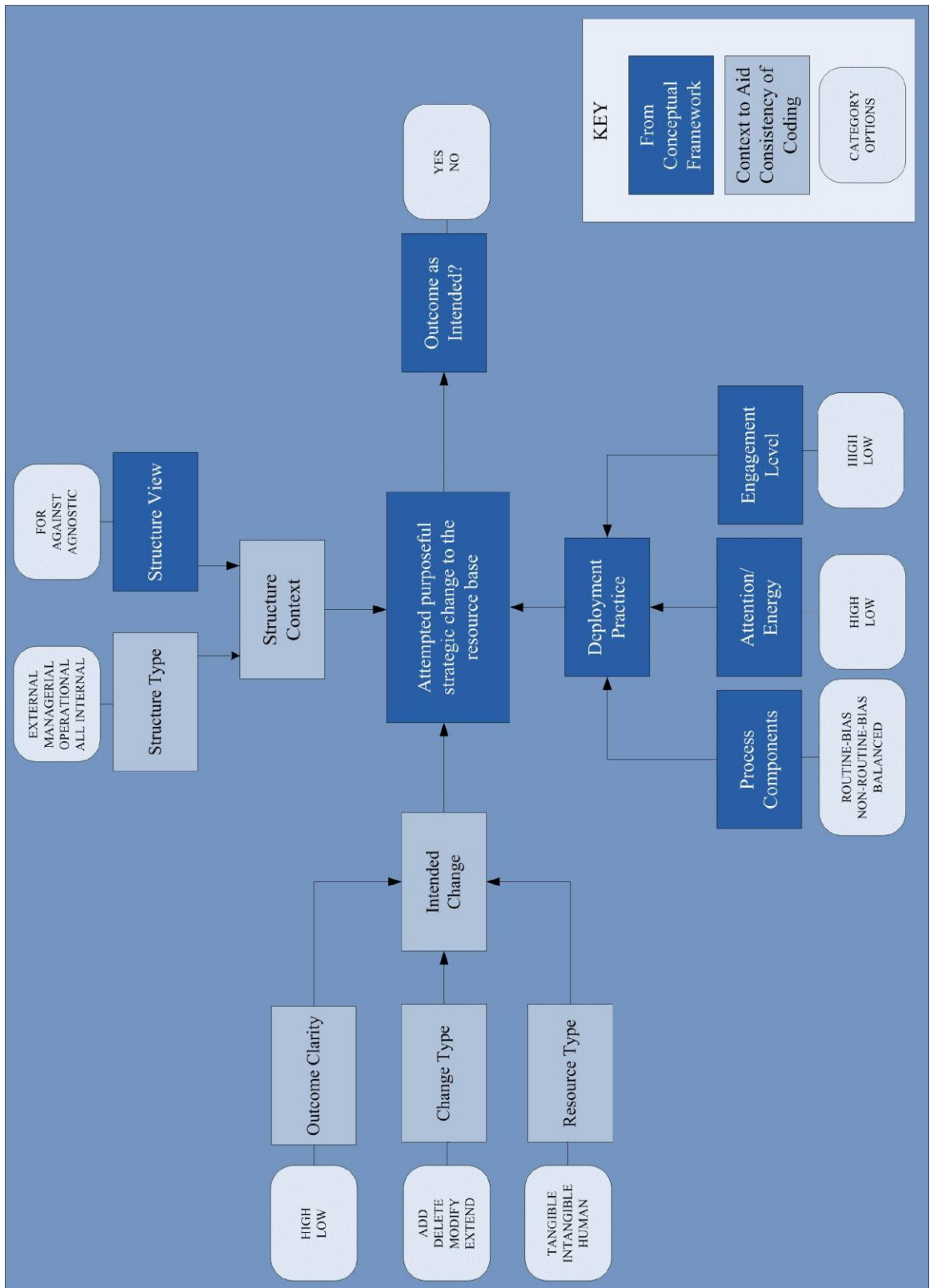


Diagram 4.2 – Theoretical Coding Framework

First and Second Coding

For both contexts, the coding exercise was initially carried out by the author for each unit of analysis identified through empirical investigation (205 in total across both cases). Thereafter, the coding exercise was repeated for the identified cases by the KTP associate working in each organisation. These individuals were selected for reasons of practicality – availability and access – and reliability – Masters graduates having similar participative experience within the organisation as the researcher. The KTP associates were each given the coding documents (diagram 4.2 and appendix 4.1), the rich data sources and a coding template and were asked to code (independently) the change events against the framework in diagram 4.2. Across both organisations, a total of 1845 codes were generated (9 categories, 205 change events). In AGS, the independent coder initially agreed with 800 out of the 1053 codes (76%); in the Solway context, initial agreement was 578 out of 792 codes.

The results were discussed with the second coders to resolve differences. This provided a useful check of the researcher's interpretation of events and in both cases, the level of agreement was resolved to >98%. The majority of initial disparities were a result of different interpretations of the coding system as presented in appendix 4.2 – to avoid biasing the coders, minimal explanation and example had been given prior to second coding. Upon clarification of the criteria, a small number of disagreements remained, principally about the views of the engaged structure and the level of managerial engagement. These disagreements were resolved through clarifying discussions with further organisational actors.

After the first phase of analysis had been conducted, the rich case data was organised by time, by conceptual category and by substantive narrative. This derived data formed the basis of a second phase of analysis as now described.

Phase 2

The aim of phase 2 was to reconstruct the data 'fractured' in different ways in phase 1 in order to generate a bounded set of propositions which might be used to address

the sub-research questions raised at the end of chapter 3. To do so, several different techniques were employed.

Firstly, a simple quantitative approach known as quasi-statistical analysis was conducted on the theoretically coded data, generating numerical and visual representations of events in each case context. In parallel, backwards looking explanatory analysis known as retroduction of the case study narratives generated interpretations of events. These techniques were used in tandem to stimulate analysis – retroduction would focus attention on particular quasi-statistics and vice versa – and propositions relating to the influence of necessary factors on dynamic managerial capabilities deployment emerged (and therefore sub research question 1)

Subsequently, the retroductive analysis and quasi-statistics were used in combination with the time ordered displays to identify between case influences for sequential and concurrent deployments of dynamic capabilities. This analysis is used to generate further propositions in line with the requirements of addressing sub research questions 2 and 3.

Quasi-Statistics

18 months of participative fieldwork within an organisation yields a huge volume of data upon which analysis needs to be completed, even when specific cases are targeted. Faced with such a mountain of data, a psychological and practical challenge presents itself to the researcher in making valuable and robust analysis that contributes to the aims of the study (Miles and Huberman, 1994, Easterby-Smith et al, 2002).

Maxwell (2005, p113) describes quasi-statistics as “simple numerical results that can be readily derived from data”. According to Becker (in Maxwell, 2005, p113), “One of the greatest faults in most observational case studies has been their failure to make explicit the quasi-statistical basis of their conclusions”. Miles and Huberman (1994, p253) further add that “In qualitative research, numbers tend to get ignored” even though counts can be used to help establish patterns, frame qualitative observations and verify findings. Where quasi-statistics are derived, they can be used to provide

structure to qualitative data and enable traceable and transparent interpretation, heeding Silverman's (2003) warning to guard against anecdotalism in interpretative analysis.

Quasi-statistics are used as an aid to interpretation of the case data in this thesis. They take the form of simple counts and percentages to direct the researcher towards points of differentiation in the deployment events recorded where rich data can be drawn on for explanation building. Furthermore, visual controls – graphics based, colour coded displays (Chase et al, 2004) – are used to provide intuitive indicators as to where rich data require interpretation.

Quasi-statistics and visual controls are not unfamiliar analysis methods to the author. As a production process engineer, such tools were regularly used to support problem solving in a qualitative corporate environment. Simple counts, averages and percentages were found to be valuable not only in making sense of the phenomena under investigation (e.g. a below expected production volume output) but also enabled communication with peers, subordinates and superiors as to the rationale underpinning problem solving and subsequent decision making. Visual controls were effective mechanisms for prompting decisions based on reasoning (fuzzy logic), particularly when dealing with systems involving human factors.

A vital consideration in the deployment of quasi-statistics is that they are recognised as a means to an end and not an end in themselves. As urged by Maxwell (2005), a researcher should not read into them too high a degree of exactitude – statistical validity is NOT guaranteed and only the simplest calculations are conducted in order to guide qualitative analysis. They also present analysis of events in a synchronic way – that is, parameters are built up by characterising events as discrete occurrences without consideration of history. In the study of a topic such as dynamic capabilities, where history and path dependence have already been argued to be important, this is a major shortcoming of the individual technique. Therefore, as an aid to qualitative interpretation, quasi-statistical techniques are used on the basis that simple numerical tools can provide useful structure and indicators, but they alone cannot be used to

form explanations (Sayer, 2000). For explanation building, retroduction is the key approach adopted in this thesis.

Retroduction

According to Sayer (1992, p107),

“(A) mode of inference in which events are explained by postulating and identifying mechanisms which are capable of producing them is called **retroduction**. In many cases the mechanism so retroduced will already be familiar from other situations and some will actually be observable. In others, hitherto unidentified mechanisms may be hypothesised. Whether a causal power or liability is actually activated or suffered on any occasion depends on conditions whose presence and configuration are contingent”

Retroduction is a critical realist approach to the interpretation of events. As argued in chapter 3, a distinction has made between a mechanism in the real world operating unmitigated and its actual effects achieved or experienced through contingent interactions with other real world objects. In this thesis, retroductive analysis takes the form of continual referral to the case narratives in order to build understanding and explanation of the real mechanisms underpinning the deployment of dynamic managerial capabilities. This fits with Costello’s (2000, p165) view that retroductive analysis should use “existing knowledge to contemplate explanations of phenomena less understood”. In recognition of the particular circumstances of the case study narratives, the retroductive approach results in contingent explanations. In other words, the explanation offered by a retrospective analysis of the mechanisms of dynamic capabilities deployment is initially tied to the geo-historical conditions in which the individual case event took place.

Diachronic Findings

Two different forms of time based analysis were conducted. These are referred to as diachronic findings as, unlike the quasi-statistical analysis, path dependence and history is (in a limited way) built in to the analysis technique. Firstly, a map of

influence, comparable with a causal flowchart as described by Miles and Huberman (1994, p225), was constructed by considering in combination the time ordered display and the case study narratives. The map of influence depicts the relationships between different cases in terms of influence of output (where a change to the resource base through one case subsequently influences the change in a different case) and learning (where the learning outcomes are deemed to have informed subsequent deployment activity). This 'map of influence' was reviewed with members of the organisation to check accuracy.

Secondly, the time ordered display was used in combination with the numerical representations to conduct a cross-sectional analysis of deployment activities at regular periods over the course of a year in both case contexts. This is referred to as a 'longitudinal sampling map' and was developed to explore the view expressed by managers in AGS that they had 'run out of steam' for strategic change over a period of months. Miles and Huberman (1994,p3) suggest that "the creation, testing and revision of simple, practical and effective analysis methods" should be encouraged in qualitative research and it is in this spirit that this analysis method is deployed. By considering the composition of event characteristics at different junctures, a crude illustration of managerial activity over time was obtained.

Creating Outputs

In combination, the findings of the second phase of data analysis are used to generate and/or test propositions about the deployment of dynamic managerial capabilities. Between the two case contexts, access and engagement with the organisation was greater with AGS than with Solway. For this practical reason, the AGS context was used to generate an initial set of propositions which were tested for replication in the Solway context.

The propositions generated and how they inform the research sub-questions is a matter addressed in greater depth in chapter 5. To draw to a conclusion the presentation of the methodology deployed in this thesis, a discussion of its strengths

and weaknesses, and also matters of validity, reliability and generalisability are now discussed.

Discussion of Methodology

Miles and Huberman (1994) comment that data collection and subsequently data analysis is an inherently selective process which is influenced by many factors. The process of collecting and reducing real world data into an analysable form and then commenting on such findings requires “many choices about what to register and what to leave out”(Miles and Huberman ,1994, p56). As such, vulnerabilities, weaknesses and errors may be introduced to the study based on the decisions of the researcher but equally, countermeasures can be adopted to reinforce the benefits of any selected approach in the context of the research project.

Accordingly, Easterby-Smith et al (2002, p41) note that the practice of research is a complex and situational affair, with researchers rarely “holding scrupulously to any single approach” and there is rarely, if ever, a best strategy or one true method for addressing a research question. The initial phase of data analysis in this thesis was intended to shape the rich data sources into three reduced formats to address the sub-research questions as described above. Arguably, the approach adopted has certain strengths. Firstly, adopting several different forms of reduction provides a foundation for analysing the empirical data in a pluralistic way and should account for the inherent weaknesses of individual approaches (Yin, 2003). Furthermore, different analytical methods examine events in ways that allow different types of (sub) research question to be addressed. The time ordered displays and case study narratives are diachronic – they capture events over time; whereas the theoretical coding of individual events is synchronic – capturing each as a discrete occurrence. In combination they should allow a coherent analysis of within case and between case events, enabling different levels of sub-research question to be addressed.

The approach adopted also has weaknesses – researcher bias is introduced in shaping the case narratives, operationalising the conceptual framework and theoretically coding events. Furthermore, there are many alternative preliminary analysis methods

which are not selected which researchers holding different ontologies might argue to be more appropriate (Denzin and Lincoln, 2000). According to Maxwell (2005, p105), there are no methods that can completely assure that analysis corresponds to reality (i.e. that bias is eliminated). Instead, confidence in the accuracy of evidence and findings may be increased through triangulation and corroboration techniques. Therefore, weaknesses of the approach described in phase 1 are in part addressed by triangulation of methods and triangulation of coders and corroboration of findings by further members of the organisations under study, as discussed below.

Validity, Reliability and Generalisability

According to Easterby-Smith et al (2002), despite originating in positivistic views of management research, the notions of validity, reliability and generalisability are key considerations for all researchers. Easterby-Smith et al (2002) further explain that validity is about using appropriate research instruments to represent reality; reliability is about using such instruments in a technically accurate, repeatable way and generalisability is about making appropriate claims about the 'representativeness' of research findings.

For a study adopting an intensive research design and incorporating critical realist views, Yin (2003) and Tharenou et al (2007) recommend that validity should be facilitated by triangulation and multiple sources of evidence; reliability should be developed by building cases over time to eliminate alternative explanations and external validity should be provided by analytic rather than statistical generalisations. Specifically, Yin (2003, p10) comments that, "Case studies, like experiments, are generalisable to theoretical propositions and not to populations or universes. In this sense, the case study, like the experiment, does not represent a "sample" and in doing a case study, your goal will be to expand and generalise theories (analytic generalisation) and not to enumerate frequencies (statistical generalisation)". Sayer (2000) is critical of the notion of statistical generalisability, stating that the concept is merely a description of a proposed formal relationship rather than any guarantee of representativeness of findings.

For this thesis, the matters of validity, reliability and generalisability are addressed as follows. Firstly, as described by Yin (2003), case studies tend to use triangulation to enhance validity, where triangulation refers to the use of multiple approaches or sources in order to offset the bias inherent in any one source. Data collection table 4.1 illustrates data triangulation – as multiple sources of evidence are used – and methodological triangulation – as multiple methods are used. Secondly, both case contexts are examined over an eighteen month period and multiple events are studied in order to collect broad set of data. This is intended to enable the development of more reliable interpretations of events.

Analytic generalisation, as recommended by Yin (2003), is developed through the concept of replication. Kwan and Tsang (1999) comment that replication is a controversial topic in social sciences because of its strong association with positivistic methods and a scientific approach which seeks law-like generalisations. However, Kwan and Tsang (1999, p765) also note that critical realism “views replication as an attempt to confirm the structures and mechanisms identified in the original study under similar contingent conditions.” Results of replication can be treated as corroboratory but not conclusive – analysis based on replication may better help explain the phenomena under study and is therefore considered useful.

Two forms of replication are considered in this thesis– literal and analytical- as prescribed by Yin (2003). Literal replication is when the same outcomes are observed in separate instances of a phenomenon; analytical replication is when different outcomes are observed but in a way which is theoretically explainable (Yin, 2003). In the use of two case contexts, this study also aims to achieve what Kwan and Tsang (1999) refer to as empirical generalisation – where the same procedures are applied in different settings with a view to checking the replication of findings (either analytically or literally).

An implication of this thesis ultimately aiming to deliver analytical generalisability is that it might be considered to be targeting a ‘mid range’ theoretical contribution . (Merton, 1968, p39) suggests that mid-range theories “lie between the minor but

necessary working hypotheses that evolve in abundance during day-to-day research and the all inclusive systematic efforts to develop a unified theory” of a particular phenomena. According to Jarzabkowski (2005, p181), “Mid-range theories explain the relationships between concepts, themes and constructs within a localised setting, enabling others to build upon these relationships in wider contexts.” In other words, the research agenda developed in chapter 8 should consider how the findings of this thesis can be developed and tested in different settings.

Finally in this discussion of methodology, although according to Coughlan and Coughlan (2002) action research should not be subject to any more concerns regarding validity than any other form of enquiry, as a relatively uncommon approach in dynamic capabilities research, it is worth considering the appropriateness of action research methods.

As already argued in this chapter, an advantage of involvement in organisational change phenomena is that otherwise undetectable intangible factors or experiential events can be recorded by using the researcher as an instrument (Janesick, 2000) However, this involvement would suggest that necessarily action research methods must be concerned with the impartiality of the researcher (Kemmis and McTaggart, 2000) and bias in the interpretation of events reported (Sayer, 1992). To counter these risks, Checkland and Holwell (1998, p18) encourage reliability through the use of “a declared in advance methodology encompassing a particular framework of ideas in such a way that the process is recoverable by anyone interested in submitting the research to a critical scrutiny.” Furthermore, action research presents the researcher with the opportunity to triangulate, in detail, events as they occur (Eden and Huxham, 1996; Checkland and Holwell, 1998; Coughlan and Coughlan, 2002; Zuber Skerrit and Perry, 2002).

Both these countermeasures have been incorporated into the approach adopted in this thesis. Accordingly, despite the increased involvement of the researcher, the participant observation data collected in both case contexts is argued to be equally as robust as the data collected by the range of further case study techniques.

Methodology Summary

As shall be discussed further in chapter 7, the methodology presented in this thesis is truly a ‘complex and situational affair’ and as such is inherently flawed by the choices of the researcher(as is any research design) (Easterby-Smith et al, 2002, p41). However, it is also hoped that by making clear the system of methods used and the reasons for their selection that a degree of transparency and reproducibility is offered to the reader. Ultimately, as represented in diagram 4.1, the methodology described in this thesis is intended to collect a rich data set from the stream of organisational activity and through iterative sifting by a range of analytical techniques, propositions may be derived which inform answers to the sub-research questions of study.

Summary Research Design & Targeted Contribution to Knowledge

Before considering the empirical findings, in light of the content of the initial chapters, anticipated contributions to knowledge are nominated and a summary research design presented in diagram 4.3 as suggested by Maxwell (2005). This exercise is intended to provide direction to the second half of the thesis as endeavours are made to address the initial research aim of developing understanding of how dynamic capabilities are deployed in practice.

Based on the views uncovered in the initial chapters of this thesis, targeted contributions to knowledge are identified as:-

- 1) Theoretical contribution
 - a. Present robust empirical evidence and related theorising to build understanding of how dynamic managerial capabilities are deployed in practice and so make a contribution to dynamic capabilities ‘practice’ theory
 - b. Make a contribution to dynamic capabilities literature regarding methodological options for assessing the micro-processes of deployment in practice, particularly the analysis of qualitative practice data

- c. Develop a clear picture of extant dynamic capabilities literature through structured literature review and combined with analysis of meta-data, make a contribution to knowledge about the field as a whole, including current make-up and trends
- 2) Practical contribution
- a. Through the careful investigation of management practice in detail in two specific contexts over time, retroduce analytically generalisable findings which can be communicated to managers to stimulate reflection about their own approach
- b. Develop explanations about how dynamic managerial capabilities can be deployed in practice in order to make the concepts more accessible and more useful to managers seeking to improve their effectiveness of making changes to the resource base

The following chapter presents the data collected through engagement with AGS and Solway and uses it to address the research questions in the context of each organisation and then comparatively between the businesses.

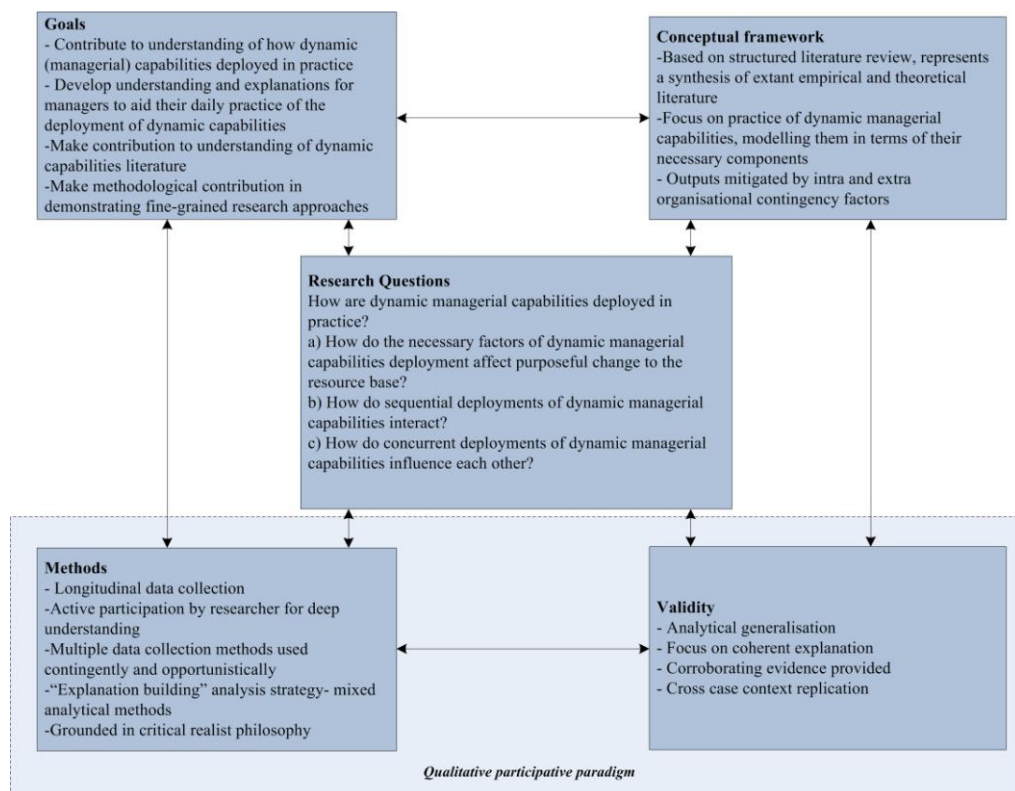


Diagram 4.3 – Thesis Research Design

Chapter 5 – Research Findings

“Critical realists ... emphasize the role of replication in research, contending that research findings should not be generalized unless they can be replicated across samples, populations and research methods.”

Mir and Watson, 2001 p1171

Chapter Summary

The purpose of this chapter is to present case data from two organisations – Architectural Glazing Systems (AGS) and Solway Structural Steel (SSS) – with which the author engaged concurrently over 18 months. The AGS case context is first examined, applying the analysis techniques outlined in chapter 4 to generate a set of propositions. These propositions are related to the sub-questions intended to address the matter of “how dynamic managerial capabilities are deployed in practice?” The AGS case is used to develop the foundational propositions as access to the organisation was more comprehensive than with SSS. The SSS case context is subsequently analysed and the replication of the propositions from the AGS case assessed. A mixture of literal and analytical replication is observed, with some propositions also being literally and analytically refuted.

The findings of this proposition-based cross case analysis are used to develop answers to the research sub-questions. Based on the empirical data from AGS and SSS, it is suggested that:-

- The most critical antecedent to effective deployment of dynamic managerial capabilities is the initial clarity of outcome
- A high level of managerial energy invested in the deployment of dynamic managerial capabilities will improve the likelihood of an intended change being achieved
- A high level of managerial engagement with the affected structure during the deployment of dynamic managerial capabilities will improve the likelihood of an intended change event succeeding

- Achieving a balance of agency and routine (as opposed to a strong bias towards one or the other) in the approach to dynamic managerial capability deployment improves the likelihood of an intended change event succeeding
- A negative or oppositional view of the engaged structure can have a substantial negative influence on the likelihood of success of dynamic managerial capability deployment.
- Sequential deployments of dynamic managerial capabilities interact in a complex way with both direct (from outcomes achieved) and indirect (from experiential learning) influences existing between deployment events
- Changes to intangible resources can act as slow to enact deployment ‘hubs’, influencing the deployment of and being influenced by the outcomes of shorter term related intended changes
- Overall, managerial energy is shown to be in scarce supply and a critical constraint on the effective deployment of dynamic managerial capabilities, and therefore, organisational dynamic capabilities

Introduction

This chapter present findings in the form of propositions based on case data from two organisations – Architectural Glazing Systems (AGS) and Solway Structural Steel (SSS) – with which the author engaged concurrently over 18 months. Deploying the methodology outlined in chapter 4, a preliminary set of propositions about how dynamic managerial capabilities are deployed is developed based on practice in the AGS case context. The Solway case context is subsequently analysed, again using the methodology from chapter 4 and the replication (or not) of the propositions from the AGS case is assessed. Such an approach is intended to provide answers to the research sub-questions outlined in chapter 3 and thus provide the basis for theorising in relation to the overall research aim outlined in chapter 1. Before discussing the findings, the conventions used in structuring the data are introduced.

Presenting the findings

In both cases, a large volume of data was collected as described in the methodology chapter. To keep track of the data recorded, an organising convention was used as depicted in diagram 5.1. This convention is an extension of the hierarchy of dynamic

capabilities introduced in diagram 3.1 to include general strategic change themes for each context.

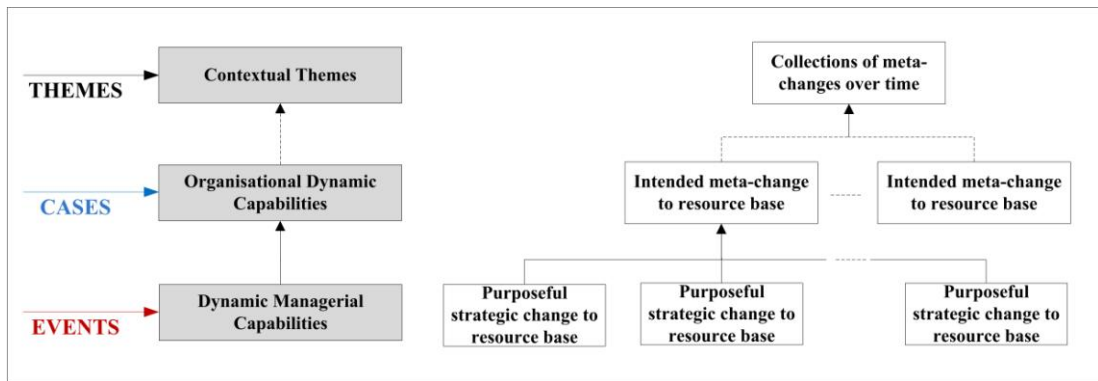


Diagram 5.1 - Case Study Data Organising Convention

The themes are related to the cases in the diagram by a dotted line to indicate that no formal relationship is inferred – the themes are simply an organising tool by which a number of cases can be referred to at the same time. On the other hand, as argued in chapter 3, dynamic managerial capabilities deployment are hierarchically related to organisational level dynamic capabilities deployment.

On this basis, a naming convention for empirical data is introduced which is used throughout the remainder of the thesis. **Events** are synonymous with the unit of analysis and the term is used to refer to deployments of dynamic managerial capabilities. **Cases** refer to intended meta-changes to the resource base at the organisational level. **Themes** are used to describe collections of cases with similar intentions. Any references made to empirical data will be tagged at an appropriate level to provide traceability by theme (with a numeric reference, e.g. theme 1), by case (with an alphabetical reference e.g. Case 1d) and by event (with a bracketed roman numeral indicator, e.g. event 1d(ii)).

Finally, as highlighted in chapter 3, it is worth reiterating that the unit of analysis is intended strategic changes to the resource base and not just any instance of strategic change in general. As suggested as a requirement for dynamic managerial capabilities deployment in chapters 2, 3 and 4, the case examples identified have a

blend of routine and agential components. It is not possible to represent the history of each organisation in full as a means of making explicit the routine aspect of each case example and as a result, the patterned aspects of deployment may not always be obvious depending on the nature of the event. Therefore, it is important to note that whilst some of the cases described may be unique in specific outcome (such as the development of a website in AGS and the attainment of ISO 14001 accreditation in Solway), they are not wholly novel in the execution of the intended change. A check step to this effect was completed by the author as part of the case study analysis.

Context 1 – Findings from Architectural Glazing Systems Ltd

Background

In July 2008, AGS engaged with both the KTP organisation and the University of Strathclyde based on a recommendation from the regional development agency, Scottish Enterprise. Previously, AGS had been engaged with Scottish Enterprise for approximately 12 months seeking assistance in upgrading their manual business planning and control systems which were developed when the organisation originally commenced trading (with a staff of 4 employees). The trigger for change emerged during a review of operations when AGS's owner and managing director developed a view that AGS's business information systems were a major source of risk to the profitable growth trajectory of the firm. Effectively the increasing volume of work in the business was generating a proportional increase in manual administrative load which would imminently require staffing up in most departments or discontinuously improving the efficiency of the information systems.

Scottish Enterprise provided a search service for AGS for both funding sources and business system vendors. However, the requisite technical knowledge was not available within AGS or Scottish Enterprise to define criteria which would allow informed vendor selection in line with AGS' specific requirements. This was a critical prompt to the commencement of academic intervention. Initially the author acted as a consultant to the business and through a five day, in-house intervention (backed by local Scottish Government funding) in August 2008 revised the scope of search and provided the business with prioritised risk information and decision

making criteria. This intervention introduced the academic to all members of the organisation from shop floor to administrative staff whilst conducting individual interviews as part of a needs analysis.

Following the initial intervention, a close working relationship was established with the owner of the business and a KTP application for a partnership between AGS and DMEM at the University of Strathclyde was approved in October 2008. During the application process, including between submission and approval, the academic continued to act as a surrogate member of the organisation, attending internal and external meetings (including vendor selection sessions) and feeding in information and advice to the managers involved.

Phase 1 – AGS Data Analysis Identified Themes

Having gained access to and established strong working relationships within the organisation, the author was presented with the potential to examine a range of cases. As already described in chapter 4, to account for the inherent strengths and weaknesses of an action research approach, examples from 3 levels of researcher involvement were sought – (a) involving the researcher as a participant (b) researcher as direct observer but non-participant (c) researcher not observer or participant. Accordingly, 9 organisational level themes were identified covering a time span in the organisation's life from June 2007 until December 2009 as represented in diagram 5.2.

The allocation of a project into a tangible, intangible or human resource category is based on discussions with the managing director as to the principle intended outcome for a change to the resource base over time, as perceived prior to the change. The classification is therefore not intended to be representative of the actual demands of the resource base change. For example, with case 1, 'Business Systems Upgrade', the acquisition and integration of a new management information system was perceived prior to change as no different to any other capital expenditure (compatibility with existing intangible and human resources was an explicit criterion of the original project specification)- it created an asset on the balance sheet and therefore was treated as a tangible resource.

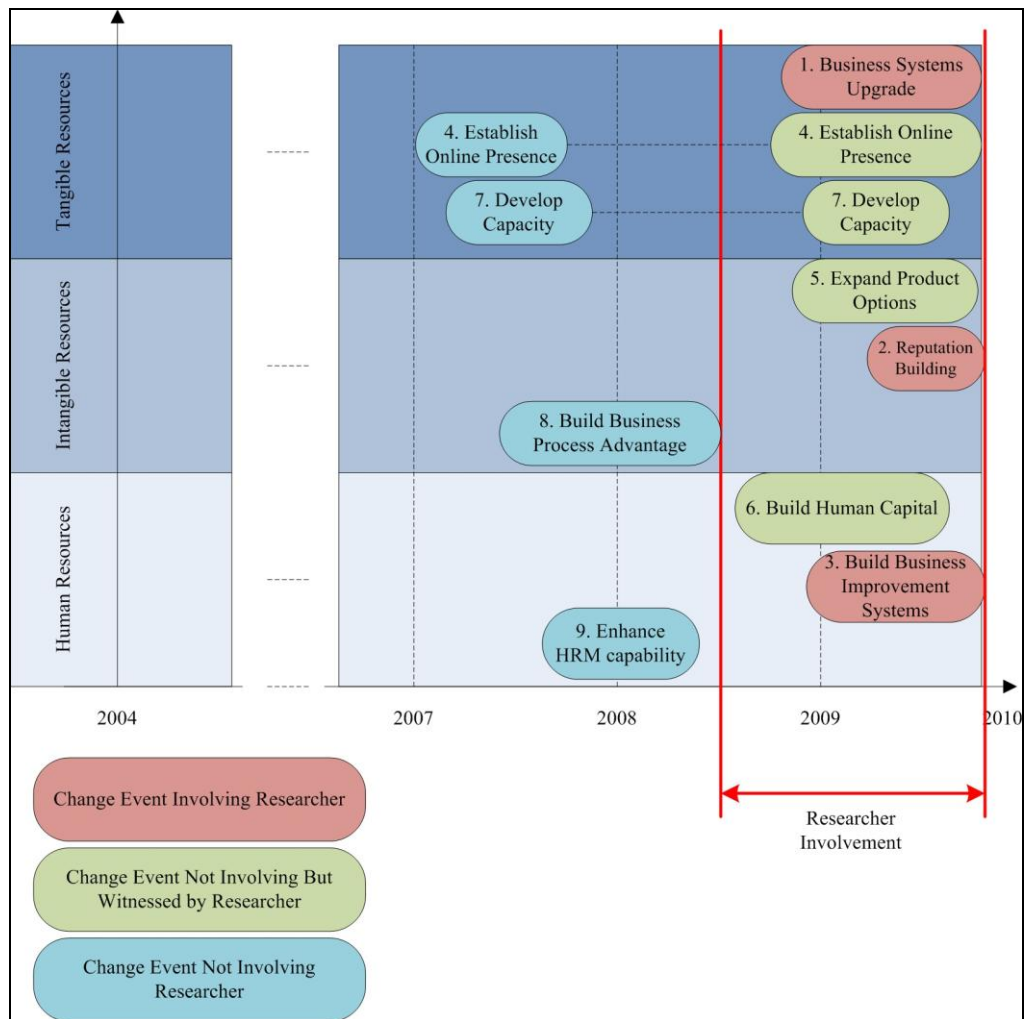


Diagram 5.2 –AGS Empirical Themes

As will be discussed in later sections, as this change progressed, this particular case required concurrent intangible, tangible and human resource changes. However, it remains in the ‘tangible resource’ section on the diagram as a reminder of the initial intended outcome.

Cases not involving the researcher were deliberately selected from a time period prior to engagement – this was to broaden the longitudinal period under investigation and to allow the research process to implicitly increase researcher understanding of the historical context of the organisation.

A more detailed representation of the chronology of the case data is presented in a **time ordered map** in appendix 5.1. The construction of this map primarily served as an aid to the creation of the case study narrative described in the next section and a

point of departure for the second phase of data analysis. Temporal considerations will be discussed in more depth through analysis of the diachronic findings.

Summary Case Narrative

As described in chapter 4, a substantive coding of the rich case data was undertaken to create **case narratives**. This section offers the reader a summary of the cases examined by theme in order to provide background information to frame further analysis. A more detailed, event level case narrative is contained in appendix 5.2. for further reference.

Theme 1 – Business Systems Upgrade

The idea of upgrading the business systems was conceived the managing director. Under advisement from Scottish Enterprise, the local enterprise agency, the MD arranged a KTP programme (**1a**).¹² Whilst this was being prepared, the MD undertook to build his knowledge (**1b**) of business systems, the needs of AGS and the business system market so that he could make informed decisions through a further funded engagement with the author. Based on market research survey and practical engagement with vendors, the MD opted to purchase EFACS (**1c**), an ERP system supplied under licence by RAD software of Kirkintilloch, which was installed in May 2009. The MD negotiated strongly on the terms and conditions and also secured further funding from Scottish Enterprise to assist the change. Once installed, the KTP project team and RAD engaged to upskill the organisation (**1d**) through training and configure EFACS (**1e**) to suit the specific business needs prior to launch. These efforts were thwarted by a sudden upturn in business consuming the organisational slack required to build the threshold system knowledge, with a revised approach to tackling these tasks instigated at the end of 2009 (not included in case data). A further issue regarding the set-up of EFACS – the establishment of a high speed communication links (**1f**) between factory units – was initiated but at the conclusion of the time period under investigation, remained on hold in anticipation of further funding support being made available.

¹² This is an example of the reference system – in this instance, if the reader wishes further details of the case they should refer to appendix 5.2 and review theme 1, case (a)

Theme 2 – Reputation Building

As a growing business aiming to establish a reputation within the industry, AGS frequently took steps to protect or enhance its reputation. An example from summer 2009 relates to the development of subcontract manufacture capacity (7c). Upon utilisation of this capacity, end product issues started to emerge on site, jeopardising reputation and profit. The MD and the KTP associate addressed the issue by successfully delivering a sub contract manufacture quality enhancement exercise on site with the manufacturer (**2a**). Furthermore, in response to challenging economic conditions a recently appointed member of the management team (**see 6a**), proposed that a workshop format event to engage suppliers and clients – sharing the plans and value-add focus of AGS – with a view to increasing the external reputation and awareness of the organisation. Accordingly, the ‘AGS Supplier Roadshow’ (**2b**) (as it was quickly dubbed) was initially run for subcontractors at Hampden Park. The collaborative management team presentation proved successful and feedback/learning captured was used to enhance the general format. This led to a first run of the AGS client Roadshow (**2c**), at AGS’ premises with a director from a major potential client. This proved effective, resulting in significant business development/tendering opportunities for AGS. It also had a powerful motivating effect on the management team, demonstrating their ability to work together and to represent the organisation. The second run of the presentation was noticeably more polished than the first run and an improved format/set of materials is ready to deploy at short notice for future business development opportunities.

Theme 3 – Business Improvement Systems

This theme was a key focus of activity in the organisation. There was mixed success in strategic change under this theme and whilst some of the intended outcomes did not transpire as originally intended, many worthwhile improvements were made. The innovation idea bonus scheme (**3a**) is a pre-KTP example of purposeful change which ultimately did not transpire as intended. Reflection on this outcome was one of a number of influences triggering the MD to use the KTP forum and resources to upskill on business improvement approaches (**3b**) in order to better influence a change in approach in the organisation. This triggered the stores upgrade project

(3c), a successful cross department collaboration which delivered a focused, discontinuous improvement to the stores operation, yielding significant cost savings in the process. This was closely followed by the successful metal waste management project (3d), valorising scrap being stored in various locations around the business and establishing an ongoing waste management mechanism. These successful exercises encouraged the MD to formalise efforts in creating a continuous improvement culture (3e), targeting the development of continuous improvement practices in operational staff. This is distinct from the broader, high level case of developing a business improvement system, as the MD perceived that the business improvement system would also incorporate discontinuous improvement and organisational innovation approaches. Whilst certain individuals quickly engaged with this ethos, others resisted and progress was slow in embedding such a change. An example of where old habits were reverted to once management focus was removed is the failure to permanently eliminate satellite stores (3f) from the shop floor or the initial failure to establish daily information sharing systems in production (3g). However, a sea change in both business and continuous improvement potential was delivered by the establishment of a cross functional business improvement forum (3h) for the management team. This set-up initially triggered the highly effective AGS Roadshow events (2b and 2c) previously described. Subsequently change events, some successful (quality systems implementation (3m); professional meeting space (3n)), some unsuccessful (vendor rating (3i) and master planning system (3k)), were initiated. Regardless of outcome, accompanying these changes were increased levels of inter-departmental collaboration and interventions yielding cost savings, increased operational flexibility, reputation enhancement and process improvements. Whilst these were not evidenced widely enough to claim that they are embedded in the culture or that the business as a whole has skilled up, the examples represent a move towards the desired culture, albeit on a longer timescale than had been initially envisaged.

Theme 4 – Build a Web-Based Presence

Most new hires to the organisation commented on the lack of company website as a surprising incongruence to the general ambition of AGS, a point which the author had picked up through early KTP discussions (1a). The domain name (4a) had

existed in the control of AGS for a number of years and was used as the email extension for staff. Internally, the addition of a number of new members of staff created sufficient dialogue on the topic to initiate a project team to populate and style a reputation enhancing website **(4b)**. A supporting grant was successfully obtained and an external agent appointed to assist progress by May 2009. By September 2009, no output was forthcoming and the activity was de-prioritised by the MD in light of the high level of operational demands on organisational resources. In concession to managers' concerns raised in the business improvement meeting **(3h)**, an interim one - page website was established.

Theme 5 – Expand Product Options

With the advent of the wider economic downturn at the end of 2008, the MD initiated an exercise to review and revise the product portfolio of AGS in order to prepare it for different market conditions. This coincided with the hiring of a commercial manager through the human capital project **(6a)**. The MD and the commercial manager identified a mid-range product system supplied by Metal Technology **(5a)** for franchise into AGS, allowing the organisation to reach a different client base whilst leveraging the new hire's extensive knowledge of the associated technology. An agreement was reached with Metal Technology and a range of jigs, fixtures, dies and software purchases **(5b)** were made in anticipation of winning a client order. However, less attention was given to the training and development of staff in Metal Technology systems **(5c)** and the fulfilment of the first metal technology order proved costly and troublesome. Some of the skills gaps took six months to resolve, requiring the use of expensive vendor subcontract support. Despite such issues, systems which were to be deleted **(5d)** from the AGS portfolio were successfully removed and the associated stock material /equipment were sold to a competitor, generating cash. Later in 2009, the commercial manager further extended the product options and associated tendering opportunities of AGS by successfully introducing the capability to manufacture high specification fire doors **(5e)** to the organisation.

Theme 6 – Build Human Capital

The MD initiated a long term project to revise the staffing within AGS, a project termed “Build Human Capital” by the HR consultant engaged in long term support with the business. The intention was to revise the collective approach (intrinsic skill set of the people and the overall culture) of the organisation to allow it to transition effectively from a £3M turnover to a £5M turnover. To make this shift profitably, the MD perceived the need to create an endemic approach of flexibility and cooperation – effectively, he was looking to change the way his managers and staff interacted in the business. As this was to inevitably involve a change in personnel, he also considered it an opportunity to up the levels of technical ability or diversify the spread of capabilities in the organisation, creating future options. The project started to take shape as a culture change initiative **(6a)**, and over the course of 15 months flows of human capital in **(6b)** and out **(6c)** of the business were carefully managed by the MD with advice and guidance from the external HR consultant.

Theme 7 – Manage Capacity

Related to their rapid growth trajectory after formation, AGS needed to expand their premises **(7a)** to accommodate a burgeoning administrative staff and a likely permanent increase in the required amount of production capacity. To do so, whilst considering a move to an entirely new location, the MD opportunistically obtained an adjacent factory unit, which was converted to meet the organisation’s needs. AGS were met with a further requirement in May 2009 to temporarily increase their production options as a capacity pinch point was identified for July 2009 following the successful tendering for a number of large contracts. The MD opted to increase the virtual capacity of the organisation by arranging subcontract manufacture capacity **(7b)**.

Theme 8 – Build Business Process Advantage

After approximately three years of operation, the MD initiated an exercise to understand, map and exploit through extending and formalising what he perceived to be the business process based advantage of AGS. Firstly, the business directors, facilitated by an external consultant (funded through Scottish Enterprise),

successfully mapped out the central business processes (**8a**) which they felt gave them a competitive advantage (response time and cost) over their more established competitors. This knowledge resource was then converted into protocols, work instructions and documentation to facilitate a controlled roll out of the business process approach to all new and established staff (**8b**). Despite the documentation being successfully pulled together, it failed to fully deploy and did not embed within the organisation. Overall, the principle successful outcome from the attempted change was an espoused shared understanding of how the business competes in the lead management team.

Theme 9 – Enhance HRM Capability

The MD enlisted the expertise of a human resources consultant to develop appropriate HRM systems in the organisation with aim of upgrading the capabilities of existing staff managers. These were lacking as the staffing hierarchy had emerged organically in response to incremental hiring through the post-formation growth period and was largely based on informal arrangements. The managers were first tasked to engage with the consultant in order to generate formal roles and responsibilities (**9a**) for all operational staff, which was successfully completed and incorporated into contracts. This exercise was subsequently repeated with the managers in AGS, with details being constructed by the MD and the consultant. Ultimately, these actions were intended to put in place formal controls for performance behaviour as the organisation continued to grow. The MD identified in interview that this formalisation of Human Resource Management and the establishment of an associated performance related culture was a critical complementary resource to the drive towards a wider business improvement and growth culture.

Theoretical Coding

Across the 9 themes and 38 case examples, 117 events were observed. As suggested in chapters 3 and 4, events were captured which both succeeded and failed in delivering change as initially intended. In line with the procedure described in the methodology chapter, these events were coded against the theoretical coding

framework represented in diagram 4.2. As a result of this exercise, a **conceptual characteristics matrix** describing the change events in terms of the coding options described in appendix 4.2 was created. This intermediate analytical outcome is easier to scan and interrogate than the case narrative but it sacrifices granularity of data to do so. Therefore, it is displayed in appendix 5.3 for reference but not discussed further at this juncture. Instead, the theoretical coding is drawn on once it has been converted to quasi-statistics in phase 2.

Phase 1 AGS summary

The three analysis methods deployed in phase 1 converted a broad rich data set into complementary intermediate outcomes in the form of time ordered displays, case narratives and a conceptual characteristics matrix. Using Miles and Huberman's (1994, p56) terms, these outcomes represent a 'thinning' of the original 'thick' data set through selection of particular phenomena over time on which to focus and their representation from the perspective of the researcher in various formats. From a critical realist perspective, such analysis represents the process of abstraction and highlights the reduced view of actual events which is garnered by empirical investigation. As such, it is important that these outputs are used coherently to provide a corroborated version of events. Phase 2 undertakes this constructive process of corroboration as described in the next section.

Phase 2 - AGS

To build propositions in response to the sub-research questions, the analytical methods deployed in phase 2 were used in combination. This section presents the analysis and interpretation of the phase 1 intermediate outcomes and the associated research propositions which emerged, and is presented in order of research sub-question.

Addressing sub-research question 1

In addressing the first research sub-question, a combination of quasi-statistical outputs and retroductive sense-making were used. Table 5.1 represents a high level

count of the event characteristics as theoretically coded from the AGS rich case data set. For further detail, the reader is directed to the tables in appendix 5.4 which present cross-tabulated counts for each of the coding options.

To make sense of this data and shape it into research propositions, each of the categories identified in table 5.1 are discussed in turn. For each category and its related criteria, two **quasi-statistical representations** are used to direct retroductive analysis. The first representation shows the % dual presence of factors as a means to highlight which coding options commonly occur together. The second representation further develops this view by showing the % success rate of realised outcomes for each combination of factors

Category	Criteria	Coding Option	Total	% of total
Intended Outcome	Resource Type	Tangible	37	32%
		Intangible	33	28%
		Human	47	40%
	Change Type	Add	45	38%
		Delete	3	3%
		Modify	49	42%
		Extend	20	17%
Clarity of Outcome	Clarity of form of intended outcome High	50	43%	
	Clarity of form of intended outcome Low	67	57%	
Deployment Practice	Energy	Manager Attention/Energy High	64	55%
		Manager Attention/Energy Low	53	45%
	Engagement	Manager Engagement High	56	48%
		Manager Engagement Low	61	52%
	Approach	Routine biased	30	26%
		Non-Routine biased	31	26%
Balanced		56	48%	
Structural Context	Engaged Structure	External	29	25%
		Managerial	39	33%
		Operational	30	26%
		All Internal	19	16%
	Structure View	Organisation For	39	33%
		Organisation Against	54	46%
Organisation Agnostic		24	21%	
Realised Outcome	Success	Yes	87	74%
		No	30	26%

Table 5.1 – High Level Counts of AGS Event Characteristics

The use of visual indicators on top of these quasi-statistical outcomes makes apparent patterns emerge (see appendix 4.3 for the colour coding schema used). As discussed in chapter 4 however, in building propositions the quasi-statistics do NOT infer any kind of statistical validity and must be used in combination with **contingent explanations** derived from retroductive analysis of the case narrative to create corroborated propositions.

Intended Change Characteristics

Understanding the profile of the intended change characteristics can help frame the deployment practice used within AGS and also provides contextual information for to help explain replication across case contexts.

Quasi-statistical indicators

In terms of high level counts, table 5.1 reveals that with the exception of the “Delete” category of change type, a broad range of intended change conditions were encountered. Table 5.2 suggests that in combination with structural context and other intended change characteristics, certain combinations of characteristics were more common than others. For example, most intended tangible changes were clearly defined in advance whereas human and intangible changes were more likely to have low initial clarity; where initial clarity is low, the engaged structure is most likely to be against the change event etc. On the other hand, the combinations with deployment practice factors were more evenly enacted.

Table 5.3 suggests that intended change characteristics conditions are not equal in terms of likelihood of a successful outcome being achieved. Tangible resources seem more likely to be achieved successfully than intangible and human resource changes. Deletions (albeit gauged on small numbers) are executed successfully in three out of three case and additions and extensions appear to be executed more successfully than modifications in most circumstances. Also, it appears that initial clarity of outcome has a major impact on the likelihood of success – where initial clarity of outcome is high, across combinations of different factors the change appears far more likely to be successful.

		RESOURCE TYPE			CHANGE TYPE				CLARITY			
		TANGIBLE	INTANGIBLE	HUMAN	ADD	DELETE	MODIFY	EXTEND	HIGH	LOW		
RESOURCE TYPE	TANGIBLE	n/a	n/a	n/a	⇒ 47%	↑ 67%	⇒ 24%	↓ 10%	↑ 64%	↓ 7%	ANTECEDENT MANAGERIAL INTENTION	
	INTANGIBLE	n/a	n/a	n/a	↓ 16%	↓ 0%	⇒ 43%	⇒ 25%	↓ 16%	⇒ 37%		
	HUMAN	n/a	n/a	n/a	⇒ 38%	⇒ 33%	⇒ 33%	↑ 65%	⇒ 20%	↑ 55%		
CHANGE TYPE	ADD	↑ 57%	⇒ 21%	⇒ 36%	n/a	n/a	n/a	n/a	↑ 52%	⇒ 28%		
	DELETE	↓ 5%	↓ 0%	↓ 2%	n/a	n/a	n/a	n/a	↓ 6%	↓ 0%		
	MODIFY	⇒ 32%	↑ 64%	⇒ 34%	n/a	n/a	n/a	n/a	⇒ 34%	↑ 48%		
	EXTEND	↓ 5%	⇒ 15%	⇒ 28%	n/a	n/a	n/a	n/a	↓ 8%	⇒ 24%		
CLARITY	HIGH	↑ 86%	↓ 24%	↓ 21%	⇒ 58%	↑ 100%	⇒ 35%	↓ 20%	n/a	n/a		
	LOW	↓ 14%	↑ 76%	↑ 79%	⇒ 42%	↓ 0%	⇒ 65%	↑ 80%	n/a	n/a		
ENERGY	HIGH	⇒ 65%	⇒ 55%	⇒ 47%	⇒ 64%	⇒ 67%	⇒ 51%	⇒ 40%	⇒ 64%	⇒ 48%		DEPLOYMENT APPROACH
	LOW	⇒ 35%	⇒ 45%	⇒ 53%	⇒ 36%	⇒ 33%	⇒ 49%	⇒ 60%	⇒ 36%	⇒ 52%		
ENGAGEMENT	HIGH	⇒ 38%	⇒ 52%	⇒ 53%	⇒ 49%	⇒ 33%	⇒ 41%	⇒ 65%	⇒ 48%	⇒ 48%		
	LOW	⇒ 62%	⇒ 48%	⇒ 47%	⇒ 51%	⇒ 67%	⇒ 59%	⇒ 35%	⇒ 52%	⇒ 52%		
APPROACH	NON-ROUTINE	⇒ 35%	⇒ 40%	⇒ 25%	⇒ 29%	⇒ 33%	⇒ 24%	⇒ 25%	⇒ 30%	⇒ 24%		
	ROUTINE	⇒ 29%	⇒ 27%	⇒ 29%	⇒ 24%	↓ 0%	⇒ 24%	⇒ 35%	⇒ 30%	⇒ 22%		
	BALANCE	⇒ 35%	⇒ 33%	⇒ 46%	⇒ 47%	↑ 67%	↑ 51%	⇒ 40%	⇒ 40%	↑ 54%		
SOCIETY	EXTERNAL	⇒ 35%	⇒ 33%	↓ 11%	⇒ 36%	↓ 0%	⇒ 18%	⇒ 20%	⇒ 34%	⇒ 18%		
	MANAGERIAL	⇒ 27%	⇒ 21%	↑ 47%	⇒ 38%	⇒ 33%	⇒ 27%	⇒ 40%	⇒ 32%	⇒ 34%		
	OPERATIONAL	⇒ 27%	⇒ 30%	⇒ 21%	↓ 13%	↑ 67%	⇒ 41%	↓ 10%	⇒ 28%	⇒ 24%		
	ALL INT	↓ 11%	⇒ 15%	⇒ 21%	↓ 13%	↓ 0%	↓ 14%	⇒ 30%	↓ 6%	⇒ 24%		
ORG VIEW	FOR	↑ 54%	⇒ 27%	⇒ 21%	⇒ 49%	↓ 0%	⇒ 22%	⇒ 30%	↑ 50%	⇒ 21%		
	AGAINST	⇒ 24%	↑ 55%	↑ 57%	⇒ 36%	↑ 67%	↑ 59%	⇒ 35%	⇒ 36%	↑ 54%		
	AGNOSTIC	⇒ 22%	⇒ 18%	⇒ 21%	↓ 16%	⇒ 33%	⇒ 18%	⇒ 35%	↓ 14%	⇒ 25%		
SUCCESS	YES	↑ 89%	⇒ 64%	⇒ 70%	↑ 80%	↑ 100%	⇒ 63%	↑ 85%	↑ 92%	⇒ 61%	OUTCOME	
	NO	↓ 11%	⇒ 36%	⇒ 30%	↓ 20%	↓ 0%	⇒ 37%	↓ 15%	↓ 8%	⇒ 39%		

Key. The visual indicator colour corresponds to a value of entry in a table cell as determined by the number of options in the vertical category (see appendix 4.3 for further explanation)	2 options	3 options	4 options
	<25%	<16.7%	<12.5%
	25-75%	16.7% - 50%	12.5-37.5%
	>75%	>50%	>37.5%

Table 5.2 –% presence of Intended Change Characteristics with all other characteristics – AGS context

(%s for each combination total 100% when summed from top to bottom, not left to right)

		RESOURCE TYPE			CHANGE TYPE				CLARITY	
		TANGIBLE	INTANGIBLE	HUMAN	ADD	DELETE	MODIFY	EXTEND	HIGH	LOW
SUCCESS RATE		↑ 89%	⇒ 64%	↑ 70%	↑ 80%	↑ 100%	⇒ 63%	↑ 85%	↑ 95%	⇒ 56%
RESOURCE TYPE	TANGIBLE	n/a	n/a	n/a	↑ 90%	↑ 100%	↑ 83%	↑ 100%	↑ 94%	⇒ 60%
	INTANGIBLE	n/a	n/a	n/a	↑ 71%	none	⇒ 62%	⇒ 60%	↑ 75%	⇒ 60%
	HUMAN	n/a	n/a	n/a	↑ 71%	↑ 100%	⇒ 50%	↑ 92%	↑ 100%	⇒ 62%
CHANGE TYPE	ADD	↑ 90%	↑ 71%	↑ 71%	n/a	n/a	n/a	n/a	↑ 96%	⇒ 58%
	DELETE	↑ 100%	none	↑ 100%	n/a	n/a	n/a	n/a	↑ 100%	none
	MODIFY	↑ 83%	⇒ 62%	⇒ 50%	n/a	n/a	n/a	n/a	↑ 82%	⇒ 53%
	EXTEND	↑ 100%	⇒ 60%	↑ 92%	n/a	n/a	n/a	n/a	↑ 100%	↑ 85%
CLARITY	HIGH	↑ 94%	↑ 75%	↑ 100%	↑ 96%	↑ 100%	↑ 82%	↑ 100%	n/a	n/a
	LOW	⇒ 60%	⇒ 60%	⇒ 62%	⇒ 58%	none	⇒ 53%	↑ 85%	n/a	n/a
ENERGY	HIGH	↑ 88%	↑ 83%	↑ 95%	↑ 90%	↑ 100%	↑ 84%	↑ 100%	↑ 91%	↑ 88%
	LOW	↑ 92%	⇒ 40%	⇒ 48%	⇒ 63%	↑ 100%	⇒ 42%	↑ 75%	↑ 94%	⇒ 37%
ENGAGEMENT	HIGH	↑ 94%	↑ 88%	↑ 100%	↑ 95%	↑ 100%	↑ 90%	↑ 100%	↑ 92%	↑ 97%
	LOW	↑ 87%	⇒ 38%	⇒ 36%	⇒ 65%	↑ 100%	⇒ 45%	⇒ 57%	↑ 92%	↓ 29%
APPROACH	NON-ROUTINE	↑ 82%	⇒ 56%	↑ 73%	↑ 69%	↑ 100%	⇒ 58%	↑ 100%	↑ 93%	⇒ 50%
	ROUTINE	↑ 83%	⇒ 50%	⇒ 60%	↑ 91%	none	⇒ 50%	⇒ 57%	↑ 87%	⇒ 47%
	BALANCE	↑ 100%	↑ 75%	↑ 73%	↑ 81%	↑ 100%	↑ 72%	↑ 100%	↑ 95%	↑ 72%
SOCIETY	EXTERNAL	↑ 85%	↑ 100%	↑ 100%	↑ 94%	none	↑ 89%	↑ 100%	↑ 88%	↑ 100%
	MANAGERIAL	↑ 100%	⇒ 43%	↑ 86%	↑ 76%	↑ 100%	↑ 77%	↑ 100%	↑ 88%	↑ 78%
	OPERATIONAL	↑ 90%	⇒ 60%	⇒ 40%	↑ 83%	↑ 100%	⇒ 55%	⇒ 50%	↑ 100%	↓ 31%
	ALLINT	↑ 75%	↓ 20%	⇒ 50%	⇒ 50%	none	↓ 29%	↑ 67%	↑ 100%	⇒ 38%
ORG VIEW	FOR	↑ 95%	↑ 78%	↑ 80%	↑ 95%	none	↑ 82%	↑ 67%	↑ 96%	↑ 71%
	AGAINST	↑ 67%	⇒ 50%	⇒ 59%	⇒ 56%	↑ 100%	⇒ 48%	↑ 86%	↑ 83%	⇒ 44%
	AGNOSTIC	↑ 100%	↑ 83%	↑ 90%	↑ 86%	↑ 100%	↑ 89%	↑ 100%	↑ 100%	↑ 88%

Key	Visual Indicator Colour
	≤33% - Low Success Rate
	33-67% - Medium Success Rate
	≥67% - High Success Rate

Table 5.3 –% Event Success Rate of Intended Change Characteristics in Combination with Alternative Factors – AGS context

Based on the quasi-statistics, the following tentative propositions are made:-

P1- Tangible resource changes are the most likely to be executed successfully

P2 – Intangible resource changes are the least likely to be executed successfully

P3 – Deletions, additions and extensions of resources are easier to achieve than modifications of resources

P4 – Initial clarity of outcome has a major impact on the likely success of the deployment of resource base change – where it is low, success is far less likely

Discussion of Propositions and Retroductive Analysis – Intended Change

The case study narratives seem to confirm these propositions. Intended tangible changes were typically clearly visualised in terms of outcome characteristics by the instigating manager before implementation and many successful additions to and extensions of tangible resources are in evidence. For example, in adding financial resources as part of the new business system implementation, (cases 1a and 1c), the MD targeted and obtained very specific funding sources (national and local government initiatives respectively) with clearly defined external contributions when adding to the financial resources of the organisation (see also cases 1b, 4b, 8a for further examples). Equally, when acquiring physical resources to be used to the benefit of the organisation such as the product system capital equipment (cases 5b and 5e), very specific physical resources were specified and obtained within a clearly defined set of requirements (see also cases 1c, 3n, 7a, 7b for further examples). In making tangible changes, the high level of clarity of intended change made it easy to communicate requirements and to assess when a change was completed.

Conversely, intangible changes were very often communicated in vaguer terms without the same level of clarity as tangible changes as to the details to be implemented. For example, in case (3k), when seeking to establish a central planning mechanism, the form and function of the required outcome was only loosely described – the underlying planning logic and informational output needs were not clarified. The resulting ambiguity and contention amongst those affected undermined efforts to deliver the system. Further case events relating to operational systems (cases 1e, 3g, 3i, 3k, 5c); cultural changes (cases 3a, 3f, 6a, 8b, 9a) and relational

outcomes (cases – 3e, 4b) all provide further examples of where targeted intangible resource change events did not deliver the outcomes anticipated. It would seem that in some of these cases (such as case 1e, configuring EFACS to match the business processes), efforts to deliver the targeted outcomes were confounded by changes in organisational context. However, in such situations, contingency planning was inhibited by a lack of initial clarity as to the specific mechanisms and outcome parameters which were intended at the outset of the deployment event.

Proposition 3 is harder to confirm from the case study narratives as (a) there are very few deletion examples to examine and (b) there are examples of successful modification type changes and unsuccessful addition and extension type changes. Considering the profile of the structural context in which modification changes are made (table 5.2) suggests that there is a strong emphasis on operational and general internal structures with resistive tendencies. Reflecting on participant and direct observational data about changes such as the development of a continuous improvement culture (case 3e), attempted modification changes were more vulnerable to the whims of the members of the engaged structures whom were required to change how they did things, than within-cases such as 3m (formalising quality systems) which required an operational structure to do the same thing in a different context (either extending an existing approach to a new task or adding new inputs to an existing approach).

Proposition 4 is widely supported from the case narratives – where initial outcome clarity was low and the intended change was not delivered, initial outcome clarity generally appeared to play a major contributing role. For example, the mechanisms (such as for idea selection, reward and recognition, implementation) underpinning the Innovation Ideas initiative (case 3a) were not clear from the outset and the change was initialised based on a loosely defined intended outcome. However, the case data strongly suggests that the interpretation of the intended outcomes by the instigating manager and affected structure did not align. As a consequence, specific resource base changes relating to employee motivation, incremental cultural changes towards continuous improvement approaches and physical improvements to the

production operation did not transpire. Further examples are presented in the appendix relating to development of skills (cases 1d, 3e, 3h, 5c), processes and systems (case – 1e, 3a, 3g, 3i, 5c, 6a, 8b); employee culture and motivation (case – 3a, 3e, 3f, 3i, 4b, 6a, 8b, 9a) and relational outcomes (case – 3e, 4b), within which there are instances of deployment events where a low level of initial clarity appears to impact the outcomes achieved.

Based on interpretation of the case narratives and the rich case data, it is conceivable that the reason why different resource type and change type events are deployed to different levels of success is that they inherently vary in their opaqueness and how they might be described. As such, the ability of a manager to communicate clearly with an engaged structure as to their intention for the change event may be linked to the nature of the intended change itself. Tangible changes are easier to specify, assign responsibility and audit delivery. By their physical nature, even when complex, tangible changes are the easiest form of resource type change to specify in objective or quantified terms with low ambiguity. When combined with an MD/owner's power position, low ambiguity management fiat for change is unlikely to be resisted ongoing by the engaged structure (even if the engaged structure is opposed to such a view). However, in the case of intangible changes (such as developing an improvement culture) or subjective human changes (such as increasing collaborative skills), the outcomes are far more challenging to communicate with clarity. (e.g. buy me a machine that makes 100 units a minute is less ambiguous than make the process better). Causal ambiguity can obfuscate managerial intentions when communicated and there is far more scope for the engaged structure to resist the change without appearing to directly be defying managerial fiat.

In effect, social interaction between an instigating manager and the engaged structure in the course of dynamic managerial capabilities may be inhibited by an initial low clarity of the intended outcome.

		ENERGY		ENGAGEMENT		APPROACH			
		HIGH	LOW	HIGH	LOW	NON-ROUTINE	ROUTINE	BALANCE	
RESOURCE TYPE	TANGIBLE	⇒ 38%	⇒ 25%	⇒ 25%	⇒ 38%	⇒ 35%	⇒ 40%	⇒ 25%	ANTECEDENT MANAGERIAL INTENTION
	INTANGIBLE	⇒ 28%	⇒ 28%	⇒ 30%	⇒ 26%	⇒ 29%	⇒ 27%	⇒ 29%	
	HUMAN	⇒ 34%	⇒ 47%	⇒ 45%	⇒ 36%	⇒ 35%	⇒ 21%	⇒ 46%	
CHANGE TYPE	ADD	↑45%	⇒30%	↑39%	↑38%	↑42%	⇒37%	↑38%	
	DELETE	↓3%	↓2%	↓2%	↓3%	↓3%	↓0%	↓4%	
	MODIFY	↑39%	↑45%	⇒36%	↑48%	↑39%	↑40%	↑45%	
	EXTEND	⇒13%	⇒23%	⇒23%	↓11%	⇒16%	⇒23%	⇒14%	
CLARITY	HIGH	⇒50%	⇒34%	⇒43%	⇒43%	⇒48%	⇒50%	⇒36%	
	LOW	⇒50%	⇒66%	⇒57%	⇒57%	⇒52%	⇒50%	⇒64%	
ENERGY	HIGH	n/a	n/a	⇒73%	⇒38%	⇒58%	⇒50%	⇒55%	
	LOW	n/a	n/a	⇒27%	⇒62%	⇒42%	⇒50%	⇒45%	
ENGAGEMENT	HIGH	⇒64%	⇒28%	n/a	n/a	⇒52%	⇒37%	⇒52%	
	LOW	⇒36%	⇒72%	n/a	n/a	⇒48%	⇒63%	⇒48%	
APPROACH	NON-ROUTINE	⇒ 28%	⇒ 25%	⇒ 29%	⇒ 25%	n/a	n/a	n/a	
	ROUTINE	⇒ 23%	⇒ 28%	⇒ 20%	⇒ 31%	n/a	n/a	n/a	
	BALANCE	⇒ 48%	⇒ 47%	↑ 52%	⇒ 44%	n/a	n/a	n/a	
SOCIETY	EXTERNAL	⇒34%	⇒13%	⇒32%	⇒18%	⇒16%	⇒37%	⇒23%	STRUCTURAL CONTEXT
	MANAGERIAL	⇒31%	⇒36%	↑39%	⇒28%	↑39%	⇒30%	⇒32%	
	OPERATIONAL	⇒20%	⇒32%	⇒21%	⇒30%	⇒23%	⇒20%	⇒30%	
	ALL INT	⇒14%	⇒19%	↓7%	⇒25%	⇒23%	⇒13%	⇒14%	
ORG VIEW	FOR	⇒ 38%	⇒ 28%	⇒ 34%	⇒ 33%	⇒ 19%	↑ 53%	⇒ 30%	
	AGAINST	↑ 55%	⇒ 36%	⇒ 48%	⇒ 44%	↑ 58%	⇒ 27%	↑ 50%	
	AGNOSTIC	↓ 8%	⇒ 36%	⇒ 18%	⇒ 23%	⇒ 23%	⇒ 20%	⇒ 20%	
SUCCESS	YES	↑89%	⇒57%	↑95%	⇒56%	⇒71%	⇒67%	↑80%	OUTCOME
	NO	↓11%	⇒43%	↓5%	⇒44%	⇒29%	⇒33%	↓20%	

Key	The visual indicator colour corresponds to a value of entry in a table cell as determined by the number of options in the vertical category (see appendix 4.3 for further explanation)	2 options	3 options	4 options
		<25%	<16.7%	<12.5%
		25-75%	16.7% - 50%	12.5-37.5%
		>75%	>50%	>37.5%

Table 5.4 –% presence of Deployment Approach Factors with Other Factors – AGS context

		ENERGY		ENGAGEMENT		APPROACH		
		HIGH	LOW	HIGH	LOW	NON-ROUTINE	ROUTINE	BALANCE
SUCCESS RATE		↑ 89%	⇒ 57%	↑ 95%	⇒ 56%	↑ 71%	↑ 67%	↑ 80%
RESOURCE TYPE	TANGIBLE	↑ 88%	↑ 92%	↑ 94%	↑ 87%	↑ 82%	↑ 83%	↑ 100%
	INTANGIBLE	↑ 83%	⇒ 40%	↑ 88%	⇒ 38%	⇒ 56%	⇒ 50%	↑ 75%
	HUMAN	↑ 95%	⇒ 48%	↑ 100%	⇒ 36%	↑ 73%	⇒ 60%	↑ 73%
CHANGE TYPE	ADD	↑ 90%	⇒ 63%	↑ 95%	⇒ 65%	↑ 69%	↑ 91%	↑ 81%
	DELETE	↑ 100%	↑ 100%	↑ 100%	↑ 100%	↑ 100%	none	↑ 100%
	MODIFY	↑ 84%	⇒ 42%	↑ 90%	⇒ 45%	⇒ 58%	⇒ 50%	↑ 72%
	EXTEND	↑ 100%	↑ 75%	↑ 100%	⇒ 57%	↑ 100%	⇒ 57%	↑ 100%
CLARITY	HIGH	↑ 91%	↑ 94%	↑ 92%	↑ 92%	↑ 93%	↑ 87%	↑ 95%
	LOW	↑ 88%	⇒ 37%	↑ 97%	↓ 29%	⇒ 50%	⇒ 47%	↑ 72%
ENERGY	HIGH	n/a	n/a	↑ 93%	↑ 83%	↑ 83%	↑ 80%	↑ 97%
	LOW	n/a	n/a	↑ 100%	⇒ 39%	⇒ 54%	⇒ 53%	⇒ 60%
ENGAGEMENT	HIGH	↑ 93%	↑ 100%	n/a	n/a	↑ 94%	↑ 82%	↑ 100%
	LOW	↑ 83%	⇒ 39%	n/a	n/a	⇒ 47%	⇒ 58%	⇒ 59%
APPROACH	NON-ROUTINE	↑ 83%	⇒ 54%	↑ 94%	⇒ 47%	n/a	n/a	n/a
	ROUTINE	↑ 80%	⇒ 53%	↑ 82%	⇒ 58%	n/a	n/a	n/a
	BALANCE	↑ 97%	⇒ 60%	↑ 100%	⇒ 59%	n/a	n/a	n/a
SOCIETY	EXTERNAL	↑ 91%	↑ 100%	↑ 94%	↑ 91%	↑ 100%	↑ 82%	↑ 100%
	MANAGERIAL	↑ 95%	↑ 68%	↑ 95%	⇒ 65%	↑ 75%	↑ 89%	↑ 83%
	OPERATIONAL	↑ 100%	⇒ 35%	↑ 100%	⇒ 39%	↑ 71%	⇒ 50%	⇒ 65%
	ALL INT	⇒ 56%	⇒ 40%	↑ 75%	⇒ 40%	⇒ 43%	none	↑ 75%
ORG VIEW	FOR	↑ 96%	↑ 73%	↑ 100%	↑ 75%	↑ 100%	↑ 75%	↑ 94%
	AGAINST	↑ 83%	↓ 11%	↑ 89%	↓ 26%	⇒ 61%	↓ 25%	⇒ 64%
	AGNOSTIC	↑ 100%	↑ 89%	↑ 100%	↑ 86%	↑ 71%	↑ 100%	↑ 100%

Key	Visual Indicator Colour
	≤33% - Low Success Rate
	33-67% - Medium Success Rate
	≥67% - High Success Rate

Table 5.5 – Success Rate of Deployment Approach Factors in Combination with Alternative Factors – AGS context

Deployment Practice Factors

Deployment practice factors describe how managers attempt to deliver the intended change to the resource base. Considering the approach adopted – in terms of the balance of patterned and non-patterned elements- may provide insight into how repeatable is deployment practice. Examining managerial resource usage might develop understanding of the constraint of management on deployment efforts. Considering levels of engagement could potentially provide enlightenment as to how structures may be addressed by managers to deliver strategic change.

Quasi-statistical Indicators

High and mid- level counts in tables 5.1 and appendix 5.4 suggest an approximately even balance between levels of managerial energy and structural engagement across observed changes. These tables also suggest that (a) the most common approach to deployment practice is to adopt a balance of routine and non-routine components (b) where a balanced approach is not adopted, it is approximately as likely that a non-routine bias approach will be used as a routine-biased approach. Table 5.4 appears to confirm this pattern of approaches. Apart from the effects of a very small number of delete examples, the main points of note relate to the alignment of high levels of attention and non-routine or balanced approaches with an organisational view opposing change; a high level of engagement and non-routine approach in addressing a managerial structure; a low level of engagement with the ‘all internal’ structure; and high levels of success relating to high energy, high engagement and a balanced approach.

Table 5.5 further suggests that the deployment practice factors have a major impact on the likely success of events. Overall, a high level of managerial energy is seen to increase the likelihood of success, particularly when the organisational view is against the proposed change. Equally, a high level of managerial engagement is seen to increase the likelihood of success, particularly when clarity of the intended change is low or the organisational view is against the change. Across the range of alternative factors, a balanced approach seems to be most associated with successful outcomes although in certain circumstances, routine or non-routine biased approaches are seen to be at least as effective.

The main implications of the quasi-statistical analysis of deployment practice factors are used to make the tentative propositions that:-

P5 – The situational demands of individual change events is likely to contribute to different deployment practice approaches being exercised (as characterised by levels of energy, engagement and the balance (routine/non-routine) of approach)

P6 – A high level of managerial energy increases the likelihood of deployment success

P7 – A high level of managerial engagement with the affected structure increases the likelihood of deployment success

P8 – A balanced approach to deployment is most likely to lead to a successful deployment event

Discussion of Propositions and Retroductive Analysis – Deployment Factors

P5 implies that dynamic managerial capabilities deployment practice is dependent on the situation and varies according to event; a view which is consistent with analysis of the case narratives. For example, the owner of the firm took a particular interest in all matters financial and he tended to lead the addition of tangible resources, focussing on securing the best deal possible (such as in case 1c – EFACS purchase and install; case 1f – communications link). In these situations, the managing director would typically proceed to make change through well practiced, low engagement negotiating routines with punctuated communication and clear demands. The managing director also took pride in his strong links with external organisations, being a vocal proponent of the local enterprise agency (case 1c) and a number of government initiatives including KTP (case 1a) and the Edge programme (from interview). He also conducted the majority of the business development activities for the organisation and as such was comfortable in engaging with external organisations – any opportunity to engage with external organisations (such as arranging KTP (1a), setting up subcontract capacity (7b), engaging with Metal Technology (5a), Process mapping with Scottish Enterprise (8a)) was taken up with a high level of attention and engagement.

Internally however, change events tended to receive different levels of managerial energy and were as likely to be initiated then delegated as they were to be shepherded through to completion. For example, many matters relating to production improvement would be initiated by the MD but then delegated to the operations manager through formal or informal channels (e.g. case 3a - Innovation ideas system, 3g/3j - morning meeting system, 3f - satellite systems, 8b -structured order fulfilment) with little further attention or engagement; whereas activities relating to human resource arrivals and departures (6b, 6c) were handled with a high level of interest, engaging with an expert external consultant and mixing routine (to comply with legal obligations) and non-routine (innovative search methods and recruitment approaches) to deliver the targeted outcomes.

As a small firm, AGS is highly resource constrained (consistent with the expectations espoused by the likes of Wernerfelt (1995), McKelvie and Davidsson (2009) and Newbert (2005) and the daily operation demands a huge amount of attention and energy from staff. Relating to proposition 6, as the owner manager of the firm, the MD is the key power holder and at first glance it may seem the case that, as one employee (anon, from interview) put it, “when the MD wants something done, it gets done”. Changes such as reconfiguring the stores layout (3c), revising roles and responsibilities (9a), developing codified records of business processes (8a) and establishment of relationships with the university (1a) were driven through successfully by a high level of managerial energy despite low initial clarity of outcome. However, there were also many instances where a change was initiated by the MD but the intention is not followed through – examples include the innovation ideas project (3a), vendor performance mechanism (3i), stores management system (3f), systematic daily information sharing system (3g) and staff up-skilling through training for metal tech launch (5f). In these instances, the MD’s energy and attention were consumed by the requirements of unforeseen short term operational matters and in the absence of explicit managerial direction and interest, the changes failed to transpire.

Regarding proposition 7, engagement levels seemed to vary according to the event–where details need to be worked out (such as interactions with the sub-contract manufacturer (2a)) as tasks proceeded, managerial engagement was higher than in tasks such as the development of a new professional meeting location (case 3n). Furthermore, many change events relating to operational staff were either delegated or deployed with little engagement (such as quality systems (3m), morning meetings (3g), satellite systems (3f)). This seemed to be for a combination of two reasons – the nature of the MD’s activities on a daily basis and his personal preferences. In having a strong external focus and leading many of the commercial activities for the business, the MD did not interact with the organisation on a daily basis and thus engagement with such structures was less routine for him (he seemed far more comfortable interacting with external parties, drawing on well practiced external collaborative routines). However, it didn’t stop the initiation of ideas from being exposed to a wide variety of external triggers. The personal preferences of the manager – i.e. his style relating to engaging with different structures – also had an impact on the emergent approaches. Overall, the success relating to the levels of engagement of these events seems to suggest that higher levels of managerial engagement do lead to higher levels of success.

In support of tentative proposition 8, it was observed that the style of approach adopted (in terms of routine, non-routine or balanced) in AGS favoured a balanced approach, particularly in events where incremental change to current systems was being attempted. Since inception, the MD had described himself as a ‘process thinker’ (in interview, 2008), and had tried many initiatives down the years to improve business processes (eg. Cases 3a - Innovation ideas ; 8b-Structured Project Management). The learning from these experiences, captured in related routines, were regularly drawn on to make further changes. However, the KTP programme, regular external interaction and new human capital entering the business regularly challenged the status quo and routine approaches were frequently mixed with agential components in the deployment of change in a familiar but incrementally different way (e.g. the improvement work completed with the subcontract manufacturer (cases 2a and 5e), the development of the AGS roadshow (cases 2b and

2c)). On occasion, change was required for which extant routines were deemed wholly adequate (e.g. obtaining an SE grant (case 1b, 4b); integrating a new product system (case 5a,5b)) or for which no suitable routine was deemed to exist (e.g. developing processes to manage subcontract logistics (case 7b); fostering collaborative abilities in different aspects of the organisation (case 3e, 3g, 6a)). On the whole though, a balanced approach did seem prevalent in the organisation.

It was observed that for adding resources, the MD had a highly effective set of routines which he would regularly use, particularly when engaging with funding agencies or potential collaborative partners. Based on specific instruction and clear advantages for the engaging partner, these routines were not as effective when deployed internally however. Examples such as the development of a continuous improvement culture (3a), the development of production processes for a new system (5c) and the adoption of processual procedures (8b) illustrate how a routine which is demonstrably effective in a different setting is ineffective in delivering change in a different context despite manager/owner fiat. Agential approaches were also shown to be effective in some settings and not in others (e.g. continuous improvement theme 3 - ineffective in creating a new centralised project planning approach (3k) but effective in creating a managerial system for continuous improvement (3h)).

Based on the rich case data, the higher level of success attributed generally to the balanced approach seemed to be in the use of routine approaches to optimise efficiency of engagement and the use of agential approaches to optimise efficacy of approach. For example, in developing the relationship with the University (1b), the MD used in part a routinised approach shaped by many years of external collaboration and engagement with public bodies which manifest itself in establishing appropriate formal and informal channels of communication, necessary legal agreements, mutual goal setting techniques etc in a proficient and efficient way. However, he also was open to adopting new ways of doing things as it was his first KTP and partnership with a University, adapting his approach to understand and gain access to University resources through sensing opportunities and making decisions based on emergent understanding and changing perceptions. As such, he was able to

optimise the outcomes for AGS whilst minimising the energy expended on matters for which an adequate routine option existed.

Structural Context Factors

The final set of characteristics considered is the structural context factors. These are examined with a view to better understanding how the engaged structure might impact deployment of dynamic managerial capabilities.

Quasi-Statistical Indicators

The high level counts of structural context factors in tables 5.1 and appendix 5.4 show a broad range of structures and structural viewpoints influencing events on a case by case configuration. Table 5.6 shows that in the AGS case data, (ignoring effects of resource deletions), external structural engagement generally concerned resource addition change events and garnered high levels of managerial energy, typically in line with the views of the engaged structure and achieving a high rate of success. Engagement with managerial structures had an emphasis human resource type change events and resource additions. Operational engagement had a strong focus on modification change events and favoured a balanced approach and was associated with engaged structures views being against the change event. ‘All internal’ engagements had a strong human resource event focus, were typified by low initial clarity and managerial engagement, were typically against the views of the engaged structure and had mixed success.

The structural view in support of change events was found most in tangible change types, addition change types and through engagement with external structures. ‘For’ views were lacking in evidence when non-routine approaches were adopted and when engagement was with operational or ‘all internal’ structural types. An agnostic approach was typically associated with a low level of managerial energy. The structural view against change was most associated with resource modification change, operational structures and the adoption of a balanced approach; it was less

		STRUCTURE				ORG VIEW			
		EXTERNAL	MANAGERIAL	OPERATIONAL	ALL INT	FOR	AGAINST	AGNOSTIC	
RESOURCE TYPE	TANGIBLE	⇒ 45%	⇒ 26%	⇒ 33%	⇒ 21%	↑ 51%	↓ 17%	⇒ 33%	ANTECEDENT MANAGERIAL INTENTION
	INTANGIBLE	⇒ 38%	⇒ 18%	⇒ 33%	⇒ 26%	⇒ 23%	⇒ 33%	⇒ 25%	
	HUMAN	⇒ 17%	↑ 56%	⇒ 33%	↑ 53%	⇒ 26%	↑ 50%	⇒ 42%	
CHANGE TYPE	ADD	↑ 55%	↑ 44%	⇒ 20%	⇒ 32%	↑ 56%	⇒ 30%	⇒ 29%	
	DELETE	↓ 0%	↓ 3%	↓ 7%	↓ 0%	↓ 0%	↓ 4%	↓ 4%	
	MODIFY	⇒ 31%	⇒ 33%	↑ 67%	⇒ 37%	⇒ 28%	↑ 54%	↑ 38%	
	EXTEND	⇒ 14%	⇒ 21%	↓ 7%	⇒ 32%	⇒ 15%	⇒ 13%	⇒ 29%	
CLARITY	HIGH	⇒ 59%	⇒ 41%	⇒ 47%	↓ 16%	⇒ 64%	⇒ 33%	⇒ 29%	
	LOW	⇒ 41%	⇒ 59%	⇒ 53%	↑ 84%	⇒ 36%	⇒ 67%	⇒ 71%	
ENERGY	HIGH	↑ 76%	⇒ 51%	⇒ 43%	⇒ 47%	⇒ 62%	⇒ 65%	↓ 21%	
	LOW	↓ 24%	⇒ 49%	⇒ 57%	⇒ 53%	⇒ 38%	⇒ 35%	↑ 79%	
ENGAGEMENT	HIGH	⇒ 62%	⇒ 56%	⇒ 40%	↓ 21%	⇒ 49%	⇒ 50%	⇒ 42%	
	LOW	⇒ 38%	⇒ 44%	⇒ 60%	↑ 79%	⇒ 51%	⇒ 50%	⇒ 58%	
APPROACH	NON-ROUTINE	⇒ 17%	⇒ 31%	⇒ 23%	⇒ 37%	↓ 15%	⇒ 33%	⇒ 29%	
	ROUTINE	⇒ 38%	⇒ 23%	⇒ 20%	⇒ 21%	⇒ 41%	↓ 15%	⇒ 25%	
	BALANCE	⇒ 45%	⇒ 46%	↑ 57%	⇒ 42%	⇒ 44%	↑ 52%	⇒ 46%	
SOCIETY	EXTERNAL	n/a	n/a	n/a	n/a	↑ 56%	↓ 4%	⇒ 21%	STRUCTURAL CONTEXT
	MANAGERIAL	n/a	n/a	n/a	n/a	⇒ 31%	⇒ 35%	⇒ 33%	
	OPERATIONAL	n/a	n/a	n/a	n/a	↓ 8%	↑ 41%	⇒ 21%	
	ALL INT	n/a	n/a	n/a	n/a	↓ 5%	⇒ 20%	⇒ 25%	
ORG VIEW	FOR	↑ 76%	⇒ 31%	↓ 10%	↓ 11%	n/a	n/a	n/a	
	AGAINST	↓ 7%	⇒ 49%	↑ 73%	↑ 58%	n/a	n/a	n/a	
	AGNOSTIC	⇒ 17%	⇒ 21%	↓ 17%	⇒ 32%	n/a	n/a	n/a	
SUCCESS	YES	↑ 93%	↑ 82%	⇒ 63%	⇒ 47%	↑ 87%	⇒ 57%	↑ 92%	OUTCOME
	NO	↓ 7%	↓ 18%	⇒ 37%	⇒ 53%	↓ 13%	⇒ 43%	↓ 8%	

Key The visual indicator colour corresponds to a value of entry in a table cell as determined by the number of options in the vertical category (see appendix 4.3 for further explanation)	2 options	3 options	4 options
	<25%	<16.7%	<12.5%
	25-75%	16.7% - 50%	12.5-37.5%
	>75%	>50%	>37.5%

Table 5.6 –% presence of Structural Context Factors by Other Factors – AGS

		STRUCTURE				ORG VIEW			
		EXTERNAL	MANAGERIAL	OPERATIONAL	ALL INT	FOR	AGAINST	AGNOSTIC	
SUCCESS RATE		↑ 93%	↑ 82%	⇒ 63%	⇒ 47%	↑ 87%	⇒ 57%	↑ 92%	
RESOURCE TYPE	TANGIBLE	↑ 85%	↑ 100%	↑ 90%	↑ 75%	↑ 95%	↑ 67%	↑ 100%	ANTECEDENT MANAGERIAL INTENTION
	INTANGIBLE	↑ 100%	⇒ 43%	⇒ 60%	↓ 20%	↑ 78%	⇒ 50%	↑ 83%	
	HUMAN	↑ 100%	↑ 86%	⇒ 40%	⇒ 50%	↑ 80%	⇒ 59%	↑ 90%	
CHANGE TYPE	ADD	↑ 94%	↑ 76%	↑ 83%	⇒ 50%	↑ 95%	⇒ 56%	↑ 86%	
	DELETE	none	↑ 100%	↑ 100%	none	none	↑ 100%	↑ 100%	
	MODIFY	↑ 89%	↑ 77%	⇒ 55%	↓ 29%	↑ 82%	⇒ 48%	↑ 89%	
	EXTEND	↑ 100%	↑ 100%	⇒ 50%	↑ 67%	↑ 67%	↑ 86%	↑ 100%	
CLARITY	HIGH	↑ 88%	↑ 88%	↑ 100%	↑ 100%	↑ 96%	↑ 83%	↑ 100%	
	LOW	↑ 100%	↑ 78%	↓ 31%	⇒ 38%	↑ 71%	⇒ 44%	↑ 88%	
ENERGY	HIGH	↑ 91%	↑ 95%	↑ 100%	⇒ 56%	↑ 96%	↑ 83%	↑ 100%	
	LOW	↑ 100%	↑ 68%	⇒ 35%	⇒ 40%	↑ 73%	↓ 11%	↑ 89%	
ENGAGEMENT	HIGH	↑ 94%	↑ 95%	↑ 100%	↑ 75%	↑ 100%	↑ 89%	↑ 100%	
	LOW	↑ 91%	⇒ 65%	⇒ 39%	⇒ 40%	↑ 75%	↓ 26%	↑ 86%	
APPROACH	NON-ROUTINE	↑ 100%	↑ 75%	↑ 71%	⇒ 43%	↑ 100%	⇒ 61%	↑ 71%	
	ROUTINE	↑ 82%	↑ 89%	⇒ 50%	↓ 0%	↑ 75%	↓ 25%	↑ 100%	
	BALANCE	↑ 100%	↑ 83%	⇒ 65%	↑ 75%	↑ 94%	⇒ 64%	↑ 100%	
SOCIETY	EXTERNAL	n/a	n/a	n/a	n/a	↑ 95%	⇒ 50%	↑ 100%	STRUCTURAL CONTEXT
	MANAGERIAL	n/a	n/a	n/a	n/a	↑ 83%	↑ 79%	↑ 88%	
	OPERATIONAL	n/a	n/a	n/a	n/a	↑ 67%	⇒ 55%	↑ 100%	
	ALL INT	n/a	n/a	n/a	n/a	⇒ 50%	↓ 27%	↑ 83%	
ORG VIEW	FOR	↑ 95%	↑ 83%	↑ 67%	⇒ 50%	n/a	n/a	n/a	
	AGAINST	⇒ 50%	↑ 79%	⇒ 55%	↓ 27%	n/a	n/a	n/a	
	AGNOSTIC	↑ 100%	↑ 88%	↑ 100%	↑ 83%	n/a	n/a	n/a	

Key	Visual Indicator Colour
	≤33% - Low Success Rate
	33-67% - Medium Success Rate
	≥67% - High Success Rate

Table 5.7 –% Success Rate of Structural Context Factors in Combination with Alternative Factors - AGS

commonly associated with tangible resource type events, routine approaches and external structural engagement.

Table 5.10 suggests the most successful form of structural engagement was with external entities, although such events suggested that an engaged structural view against the change had a big impact. Managerial engagement was generally successful as well, with the exceptions of intangible resource type changes and low levels of managerial engagement. Operational engagements were variable in outcomes, displaying a particular vulnerability when initial clarity is low. Least successful were ‘all internal’ structural engagements.

These events had a particularly low rate of success with intangible resource type, modification change type events, in the presence of an organisational view against the event, and the adoption of a routine approach (four out of four events “all internal” structural engagements failing to achieve the targeted outcomes when a routine approach was adopted.)

When the engaged structure holds a “for” or “agnostic” perspective on the change, success rates are high. Where a view against the change event is held, success rates are highly mixed with apparently low rates presenting where managerial attention is low, managerial engagement is low, a routine approach is adopted and where an ‘all internal’ engagement is attempted.

P9 – Different structures are likely to exhibit different views of change events

P10 – Structural opposition to change has a major negative impact on the likelihood of an event achieving its intended outcome

Discussion of Propositions and Retroductive Analysis – Structural Context

The previous two sections have already described aspects of the case data within AGS which support tentative propositions 9 and 10. Further analysis supports these implications. Regarding P9, generally it was observed that different structures tended to have different motivations relating to change events. In the case of external

structural engagement, change events were typically initiated which were to the obvious mutual benefit of participants. For example, engagement in KTP (1a) is a valuable academic activity and for the funders, high growth new businesses such as AGS are their target clientele. The managerial system was more resistive yet success rates were still high as the priority put on successful change events by the key power broker in the organisation offered potential rewards to managers who ‘played the game’. Operational staff did not make the same link and viewed most change events with a high level of suspicion and as situations in which there was no apparent benefit for cooperation. With ‘all internal’ events, the opportunity to be noticed participating was typically diluted and the energy invested by staff was relatedly low. Evidence of situations such as developing new skills (within case – 1d, 3e, 5c) ; revising processes and systems (within case - 1e, 3a, 3e, 3f, 5c, 6a, 8b) ; modifying collective approaches/culture (within case – 3a, 3e, 3f, 3g, 6a, 8b, 9a) supports the perspective that a structural view “against” events can have negative consequences for the achievement of the intended outcomes (P10).

Propositions 1 to 10 represent tentative contributions towards answering sub research question 1 based on a combination of contextual explanations developed from retroductive analysis of the case narratives and quasi-statistical representations.

Temporal aspects of the case data are now considered in order to develop further propositions towards answering sub-research questions 2 and 3.

Understanding the impact of sequential deployments

As described in chapter 4, the time ordered display (appendix 5.1) and the case narratives (appendix 5.2) were used in combination to construct a map of inter-deployment influence as illustrated in diagram 5.3. This map is compiled at case event (i.e. organisational) level as, in formal and informal interviews, informants talked not in terms of specific resource changes but rather at the level of the aggregate changes represented in the case data.

To prepare the map, a box was drawn for each case and the rich data and case study narratives were mined to establish linkages. These linkages represent where either

learning or resource base change outcomes are recognised as being influential on the subsequent change. However, as deployments tend to last a length of time which is very hard to specify in advance, where a deployment is ongoing and outcomes from a subsequent event influence the original, a two way arrow is used to indicate mutual influence.

Upon completion of the map, it was observed that several cases were subject to and sources of multiple mutual influences – as a visual aid to analysis, those with more than two such connections are highlighted in bold. Aspects of the map of influence are consistent with the experience of the researcher participating in and observing strategic change events in AGS. Firstly, outcomes of previous deployments of dynamic capabilities appear to have the potential to exert either direct or indirect influence on subsequent deployments. For example, the (8a) collaborative process mapping generated codified learning and insight which was (attempted) to be deployed through the wider organisation through adoption of structured project management techniques. The influence of (8a) was also clearly evident in the purchase of EFACS, which would provide a mechanism for deploying efficient, structured workflows through IT enabled automation (1c), with the MD frequently referring to aspects of the failure of (8b) and the insights gained through (8a).

Secondly, deployments can run in parallel and certain deployments, particularly those aimed at cultural change, can act as deployment “hubs”, triggering deployments and absorbing their learning outcomes to repeat the cycle. The espoused continuous improvement culture change (3e), directed at the operation, which the MD was attempting over the duration of the participant observation triggered a number of events across the range of resource changes and change types. Progressive related deployments shaped future activities and whilst some attempted changes failed to deliver the intended outcomes, the MD was always very careful to extract learning from the experience. In reviewing the events of 2009, focussing on failed changes he explicitly stated that “I would still do them as they have shown me how things really work here and in terms of understanding my staff, they have helped me know better which of them are for AGS and which of them are not”.

Thirdly, the map also illustrates the complex, nested relationship between managerially led deployments. Some of the changes reviewed (e.g. case 1b-1d EFACS purchase and implementation) were mainly planned well in advance but others were emergent reactive (e.g. case 2a - arrangement of sub-contract capacity) or emergent opportunistic (e.g. case 2c - customer roadshow). Links between ‘hub’ deployments, as sources of regularly revised routine, could be argued to contrive to create “organisational” level dynamic capabilities. Borrowing Winter’s (2003) phrasing, if the map is viewed as a whole it may represent a snapshot of the “**complex, structured and multi-dimensional**” dynamic capabilities of AGS being deployed in practice

P11 - Deployment of dynamic managerial capabilities is influenced both directly (in terms of outcomes achieved) and indirectly (in terms of experiential learning) by preceding deployments

P12 - Deployments aimed at cultural change which occurs over time can act as ‘hub’ deployments which influence the deployment of and are influenced by the outcomes of shorter term related intended changes

P13 - streams of sequential deployments seem to influence each other in a complex way

Concurrent Deployments

As described in chapter 4, to understand the influence of concurrent deployments in terms of event success, cross sections of a ‘deployment map’ are considered in diagram 5.4. This map is drawn to reflect the period of January 2009 until December 2009, as the author’s participation with AGS during this time gives him confidence that the events represented therein account for the majority of the strategic change activities of the management team.

High level details are marked on diagram 5.4 to indicate the number of and success rate of the cases ‘in progress’ at four points throughout the year. It is accompanied by a chart of deployment factors as represented in diagram 5.5. This chart is derived from a combination of the time ordered display (appendix 5.1) and the theoretically coded data to present summative quasi-statistical data at four points throughout the

year. For example at time 2, 60% of the intended change events actively deployed with HIGH managerial energy, 40% were deployed with HIGH engagement etc. For diagrams 5.4 and 5.5, the underlying calculation mechanism is arguably crude (simple counts) and the tolerances potentially wide. As an interpretive aid it is of low resolution and requires corroboration from the rich data. However, the outcome chart and cross sectional diagram tell a story which, when reviewed in light of the case narrative, is representative of the researcher's experience engaging with AGS during 2009.

Initially, the KTP programme provided a springboard for the MD to launch a number of change initiatives which started strongly. As indicated in the write-up for the EFACS theme however, around April/May time, the business won a number of large orders which, given wider economic circumstances, it felt it had no option but to accept. This led to a ramp-up of operational effort to the point where the business had to arrange subcontract volume for the first time in its history (7b). This level of business continued until the end of November

After winning the major orders, it was increasingly observable that managers, including the MD, would prioritise change initiatives according to the level of slack afforded them by the level of operational business. In between time 2 and 3 on diagram 5.4, the absolute number of successful changes being managed at once was slightly improved but the rate of failure also increased as an increasing number of concurrent deployments served to increase the scarceness of managerial resource.

Focussing specifically on the change in profile of approach from time 3 to time 4 (September to December) shows that managerial energy and engagement invested in the deployment of dynamic managerial capabilities dropped as did balanced and non-routine approaches whilst lower energy, efficient routine approaches increased. Undoubtedly the demands of operational requirements played a major role as a drain on managerial resource but equally, the high level of change initiatives and concurrent deployments had a distracting effect also. After winning the major orders, it was increasingly observable that managers, including the MD, would prioritise change initiatives according to the level of slack afforded them by the level of

operational business. In between time 2 and 3, the absolute number of successful changes being managed at once was slightly improved but the rate of failure also increased as an increasing number of concurrent deployments served to increase the scarcity of managerial resource.

Based on a time ordered analysis of cases being deployed concurrently in 2009, the following tentative research propositions are made.

P14 – Managerial energy is in scarce supply and can constrain the successful deployment of dynamic managerial capabilities

P15 – The capacity to deploy dynamic managerial capabilities may in part be determined by the level of operational business of the organisation

P16 – Where managerial resource available for dynamic managerial capabilities deployment is limited, the level of routine approach adopted may increase for implicit efficiency reasons

P17 – Concurrent deployments of dynamic capabilities might increase the number of successful change events completed in a period of time but will only do so with decreasing returns

Section Summary

The AGS case data has provided a broad range of tentative propositions which can be drawn on in order to address the sub-research questions. These propositions are arguably tied to the AGS context – that is, they could be argued to be idiosyncratic as all the cases and events examined were drawn from the one setting (albeit over time). Therefore, before offering any answers to the research sub-questions, similar data is examined from Solway - a complementary case setting (same industrial niche and locality) with which the author engaged concurrently to the AGS case. This replication check is carried out using the same methodology for data collection and analysis as described in chapter 4 although instead of generating a full set of new propositions, the propositions from the AGS case are tested.

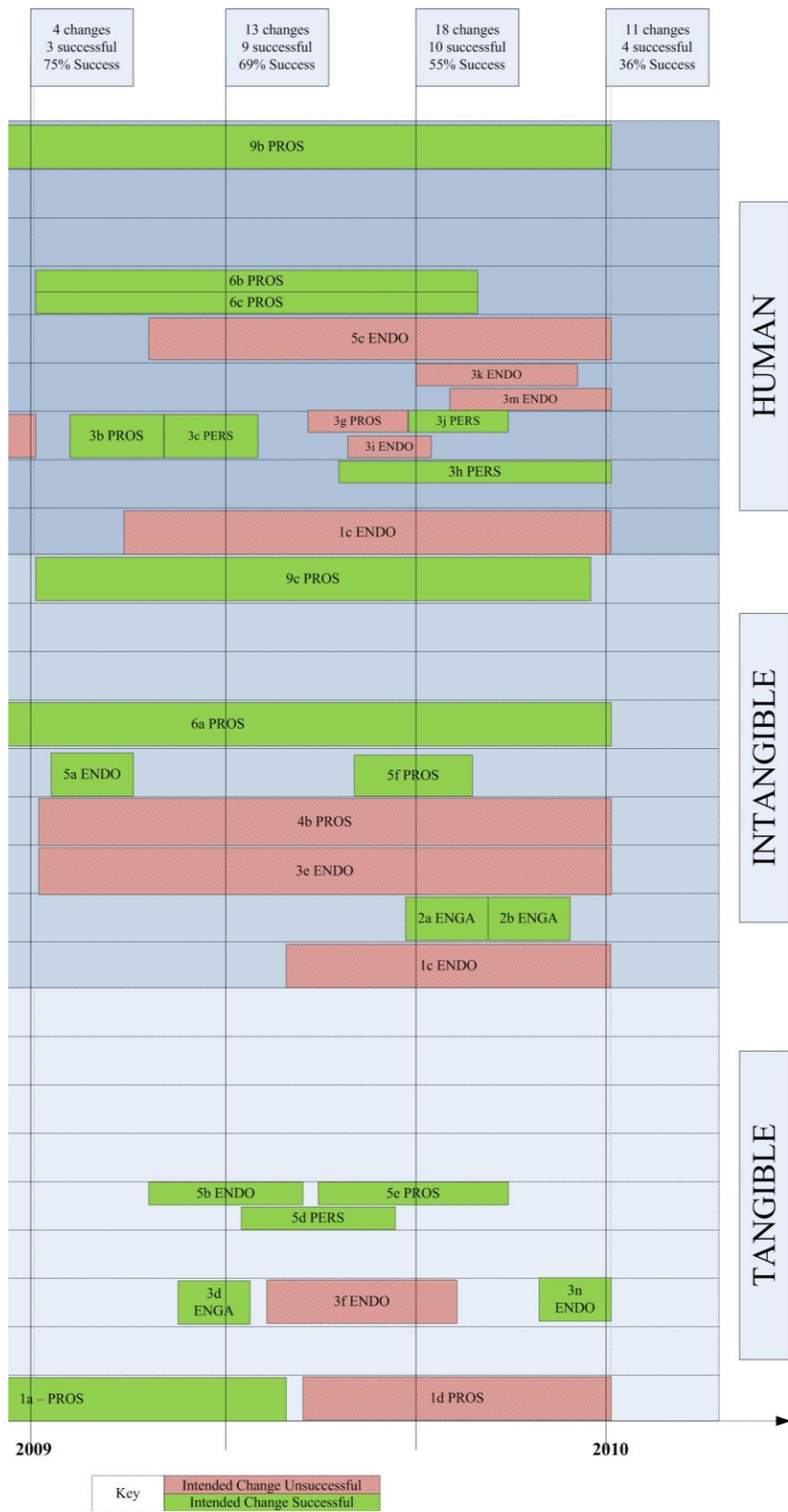


Diagram 5.4 – AGS Timeline of change events Jan-Dec 2009

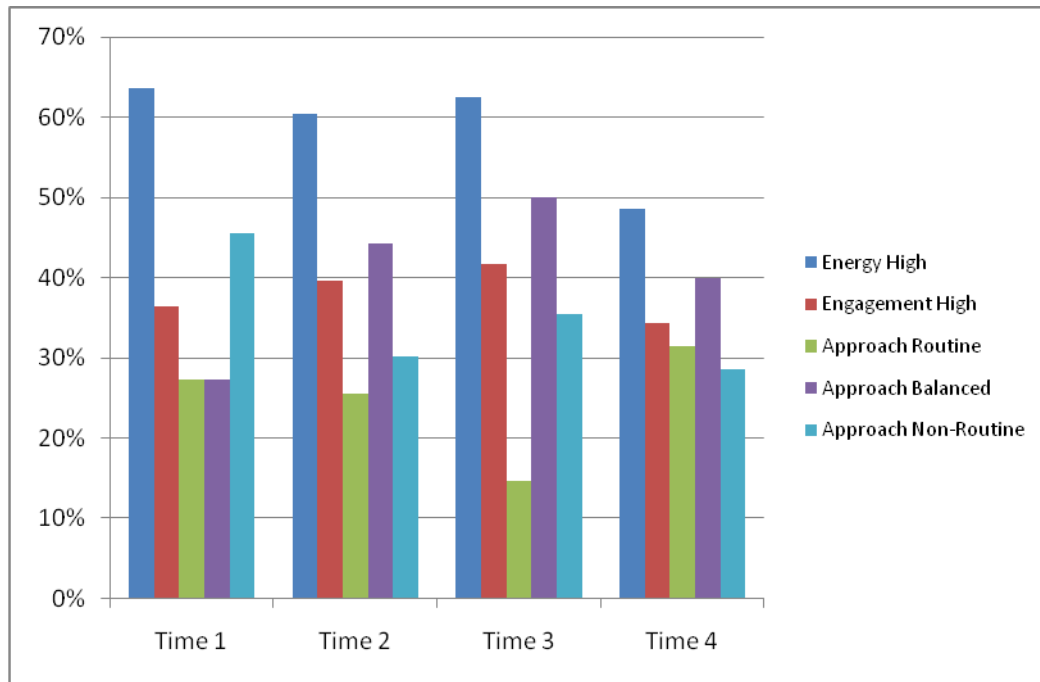


Diagram 5.5 – Event analysis at periods in Jan-Dec 2009

Case Context 2 – Solway Structural Steel

Background

Solway Structural Steel and Precast Concrete (Solway) is the manufacturing division of Barr Holdings, a multi-faceted, privately owned construction firm. With operations spread over three sites and employing 200 people, Solway supplies engineered to order materials to a variety of multi-million pound commercial construction projects such as football stadia and supermarket stores throughout the United Kingdom. Barr Holdings was founded in the 1940s by the Barr family and has grown to a turnover of c. £250M from construction related activities. It is now owned by Trench Holdings, and is organised into construction, environmental, industrial and manufacturing divisions.

Employing approximately 200 people, Solway operates over three sites in the West of Scotland, manufacturing bespoke structural components for large scale industrial construction projects. Solway operates as both an internal supplier for “Barr”

integrated projects (where the wider organisation provides a turnkey solution for clients such as Tesco) and as an external supplier to other construction firms. Solway initiated a discussion with the KTP organisation based on previous positive experiences of a divisional director working with a partnership elsewhere in the organisation. The trigger to action was the identification of vulnerability in the organisation's approach to business planning and control systems – a finding which emerged from a strategic review.

Whilst having a broad resource base and a high level of sectoral knowledge and technical ability, Solway perceived that they lacked the requisite in-house expertise in business planning and control systems to address their needs. The business leaders felt that this actually represented an opportunity to skill up versus the competition in their sector by adopting practices from mass manufacturing where daily operational pressures demand excellence in business planning and control.

Facilitated by the KTP organisation, the author engaged in dialogue with Solway senior management shortly after they recognized the need to change with the funded programme of intervention being awarded in August 2008.

Phase 1 – Solway Data Analysis - Identified Themes

The findings developed from this research context are reflective of the nature of the engagement entered into with Solway and notably different from the relationship with AGS. For a variety of reasons (including the scale of organisation, internal issues, historical approaches, personalities involved), access to the organisation was necessarily more bounded with Solway than AGS and as a result, the data available supports the consideration of fewer themes (as outlined in diagram 5.6.)

A **time ordered display** of cases is presented in appendix 5.5. The following case narrative summary is also supported by a more detailed, event level description in Appendix 5.6.

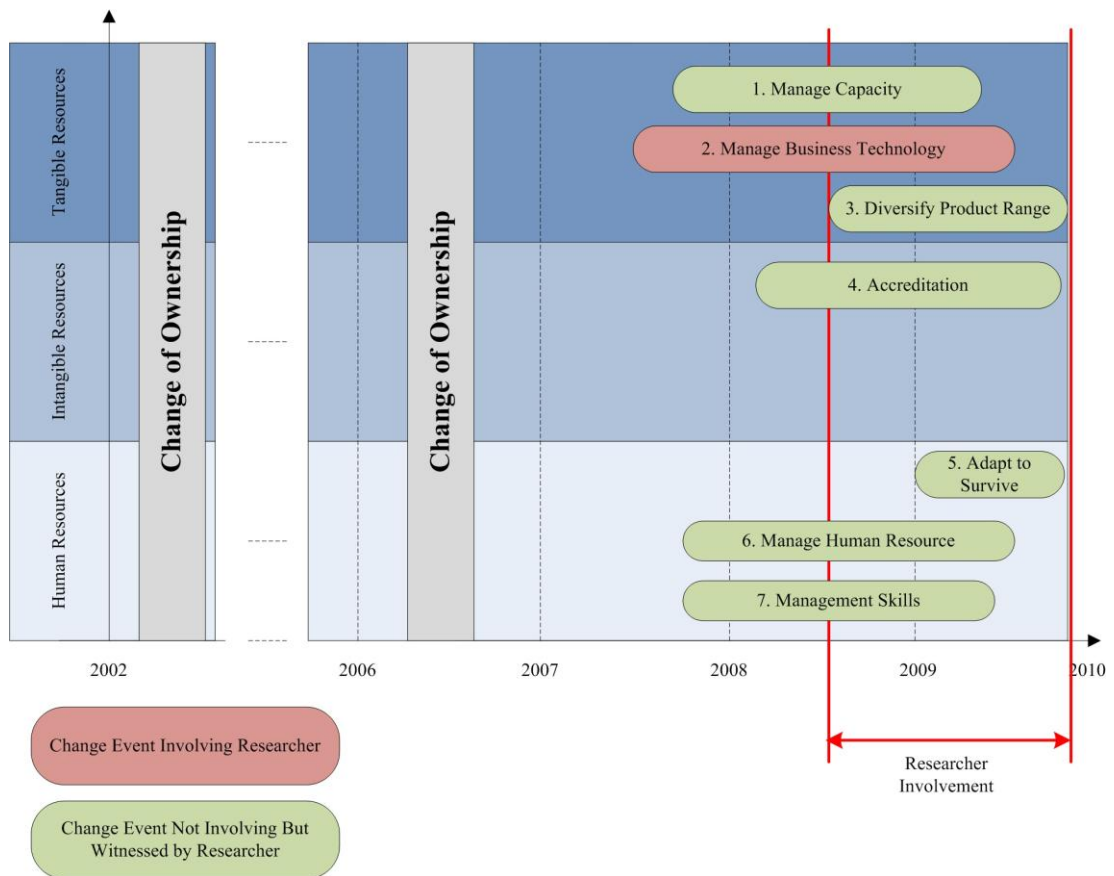


Diagram 5.6 – Solway Empirical Themes

Theme 1 – Managing Capacity

As an organisation of scale supplying to the construction sector, a key consideration for Solway was the management of its capacity. Following the acquisition of the Barr Group by Trench Holdings, a new workshop was set up at Killoch (**1a**) in order to provide overspill capacity for the main steel workshop and also capacity for low volume, high variety detailing and finishing volume work, much of which was being completed by sub-contractors. Relatedly, the organisation attempted to establish and foster relationships with key subcontractors (**1b**), particularly those with specialist skills (such as coatings capabilities). Furthermore, the capacity of the existing main workshop at Creetown was increased through capital investment and staffing up (**1c**). With a buoyant market for construction materials in early 2008, the organisation made moves to explore the development of a second mass production facility on the land adjacent to head office in Killoch (**1d**) – these plans were shelved by May 2009

however in response to a downturn in market conditions. Subsequently, the lack of market demand led to the organisation decommissioning the Killoch workshop (**1e**) to match production capacity to supply requirements. To aid the ongoing management of capacity, Solway explored the deployment of lean initiatives to increase efficiency and reliability of operations (**1f**), engaging with Scottish Enterprise and the Scottish Manufacturing Advisory Service to do so.

Theme 2 – Manage Business Technology

To improve business process efficiency, Solway and more generally the Barr group invested significantly in business technology. Solway invested in a series of upgrades to its production equipment controls and communication infrastructure to allow the linking of its CAD¹³ and CAM¹⁴ operations at different sites (**2a**). Furthermore, the KTP with the University of Strathclyde (**2b**) was undertaken to examine management information systems and the planning and control of the physical operation (initially targeted as an ERP implementation project but later refined to developing in-house controls after a change in market conditions). A financial management and control system – COINS – was purchased and adapted to fit the organisation’s needs (**2c**). As an offshoot of the KTP project, an information processing tool for converting raw labour (a key variable cost for Solway) timesheet data into weekly managerial reports and a direct input for COINS was created (**2d**).

Theme 3 – Diversify Product Range

Whilst not directly stimulated by the worsening market conditions (this project was initiated in advance of the downturn), the targeted aim of significantly diversifying the product range and related capabilities of Solway was certainly given a high level of focus by the changing environmental circumstances. Solway engaged in a number of activities to develop a differentiated product range (**3a**) around their core products of structural steel and precast concrete, seeking to build a reputation with a broader client base (through marketing activities) as a systems integrator. Solway also attempted to dissociate itself externally from the Barr ‘brand’, as the business wished to reposition itself in the market (**3c**) as an organisation which could supply to any

¹³ Computer Aided Design – product design approach enabled by a computer drawing package

¹⁴ Computer Aided Manufacture – production operation enabled by accurate computer control of tools

construction firm, rather than being viewed as an internal supplier to Barr construction. Relatedly, Solway sought to build its understanding of product branding and marketing (**3b**) through engagement with the University of Strathclyde department of marketing, hiring in of relevant skills and managerial team education.

Theme 4 – Obtain Accreditation

To deliver internal changes and a mark which could be used for external promotion, Solway engaged in both the Investors in People (**4a**) and ISO14001 accreditation (**4b**). Investors in People (IIP) is an award which is delivered for progressive human resource practices underpinned by a supportive managerial system (evidenced by procedures and behaviours). ISO 14001 is the international standards organisation's accreditation for compliance of a firm's practices (evidenced through procedures, plans and activities) to the current best approach to environmental management. For Solway, managing environmental considerations, such as waste stream reduction and recycling, is important as an internal cost saver and also as an external enabler. Many construction firms or even end clients (such as Tesco and Sainsbury's) now require their construction supply chain to conform to certain standards – ISO certification can be a pre-requisite for tendering in many circumstances. Both IIP and ISO14001 were undertaken through high level approval and the devolvement to organisational owners to understand audit criteria fully and prepare appropriately for compliance checks. Both were hampered by changes relating to case 5 and the resultant reshuffling of personnel and approaches.

Theme 5 – Adapt to Survive

According to the MD of Solway, the market demand for structural steel in the UK fell by 60% between 2008 and 2009, a level of market contraction worse than the previous recession in 1992 which had resulted in the closure of many construction-related firms. As such, the changing environmental circumstances put Solway in the position where immediate adaptation was required as a matter of survival. To this end, fiscal retrenchment (**5a**) was required throughout all aspects of the business and the management team were engaged to deliver a painful programme of consolidation resulting in an approximate reduction of 50% of the workforce. At the same time, senior management negotiations targeted a more cohesive alignment of the different

divisions of Barr and Trench **(5b)**, with increased levels of collaboration and motivation to ‘keep work in-house’ emphasised.

Theme 6 – Manage Human Resource

A concerted effort was made by Solway to adapt its human resource practices through the structured introduction of new staff with diverse abilities, upskilling of existing employees and the development of a pipeline of talent for the organisation’s future. Hiring of graduate calibre staff through KTP **(6a)** was such an endeavour undertaken by the divisional managing director, following his successful use of the programme in this way in previous roles with Trench Holdings. Broad initiatives to encourage inter-department and inter-site collaborative skills were also enacted **(6b)** with a view to creating a more open culture. Solway also invested in the establishment of a vocational training centre, apprenticeship scheme and modern workforce culture initiatives to develop the next generation of appropriate shop floor skills **(6c)**.

Theme 7 – Develop a Unified Management Culture

Solway undertook an initiative to develop a cohesive management system in a manner quite different to that in existence under the previous ownership regime. Middle management was invited to engage with senior management through participation in an annual strategy setting process led by a professional external facilitator **(7a)**. A management education programme **(7b)** was delivered to all middle and senior management under instruction from central Barr human resources covering a broad range of soft skills and functional/procedural training. Specific training was delivered to encourage peer to peer and two way hierarchical managerial communication and feedback in the management community **(7c)**. This was intended to encourage the development of a progressive management culture through the raising of awareness of the impacts of different approaches – identified as an important challenge given the construction sector stereotype of engrained autocratic management methods.

Solway Conceptual Characteristics Matrix

Across the 7 cases and 23 within case examples, 88 attempted purposeful strategic resource base change events instigated by a manager are described in appendix 5.6. These are used to create a **conceptual characteristics matrix** as represented in appendix 5.7.

Phase 1 Summary

The Solway data has been prepared in accordance with the same methodology used to examine the AGS data. Despite both organisations being materials suppliers to predominantly Scottish based construction clients, the Solway case study narrative reveals a different set of business circumstances facing the organisation (in particular the need for substantial fiscal retrenchment over the latter half of the empirical study).

In the next section, the data derived through this initial phase of analysis is further shaped through combinations of methods to assess the replicability of the propositions developed from the AGS case data.

Phase 2 Analysis - Solway

Introduction

This section aims to use the outcomes of the second phase of analysis for the Solway context to check the replicability of the findings of the propositions generated from analysis of the AGS case data. As such, whilst the same methodology was deployed in analysis, the format of presentation of results is different – focussing on corroborating rather than generating propositions. An overview of the quasi-statistical and retroductive analysis and diachronic findings are offered before a tabulated assessment of the propositions is offered. The outcome of this cross case-context comparison leads to the chapter concluding with an address of the sub-research questions.

Overview of Quasi-Statistical and Retroductive Analysis

As described in chapter 4, a set of quasi-statistical analysis has been completed for the Solway case context. The outputs of this exercise are contained in appendix 5.8.

Table 5.8 displays the high level counts of Solway event characteristics. Based on the quasi-statistical data, the Solway case context can be discussed and comparisons can be drawn to the AGS contexts. It suggests that the intended change characteristics profile is similar between the two contexts. Deployment practice counts suggest that managerial attention to change events is generally lower in the Solway context and engagement is marginally lower. Whilst a balanced approach is observed at similar high levels to AGS, in the remaining cases, a routine-biased approach dominates agential approaches in Solway. The structural context counts points towards similar levels of engagement with external organisations but a different profile of internal engagements, with the managerial structure being addressed far more frequently. The profile of structural view seems more supportive in Solway, marginally less oppositional and less agnostic about change events. Overall, the success rate of change events in Solway is marginally lower than in AGS.

The profile offered by the high level counts is consistent with the author's experience engaging with Solway. Prior to the sharp downturn in the market, the business was actively engaged in making changes to many aspects of its resource base – long term programmes of upgrading tangible resources, developing reputation enhancing accreditation and building talent at operational and managerial levels across functions. These observations support the findings of mixed change and resource types encountered. Whilst some of the tangible resource changes were clearly defined in advance (e.g. adding specific new pieces of technology) , many of these outcomes had loosely defined goals (such as “upskill the management team” and “build links with local educational facilities”) in line with the quasi-statistical suggestion of tendency towards low clarity of initial outcomes.

Category	Criteria	Option	Total	% of total
Intended Change	Resource Type	Tangible	21	24%
		Intangible	31	35%
		Human	36	41%
	Change Type	Add	34	39%
		Delete	5	6%
		Modify	35	40%
		Extend	14	16%
Clarity of Outcome	Clarity of form of intended outcome High	36	41%	
	Clarity of form of intended outcome Low	52	59%	
Deployment Practice	Attention	Manager Attention/Energy High	27	31%
		Manager Attention/Energy Low	61	69%
	Engagement	Manager Engagement High	36	41%
		Manager Engagement Low	52	59%
	Approach	Routine biased	28	32%
		Non-Routine biased	16	18%
Balanced		44	50%	
Structural Context	Structure	External	19	22%
		Managerial	45	51%
		Operational	3	3%
		All Internal	21	24%
	Structure View	Organisation For	44	50%
		Organisation Against	33	38%
Organisation Agnostic		11	13%	
Realised Outcome	Success	Yes	59	67%
		No	29	33%

Table 5.8 – High Level Counts of Solway Event Characteristics

At the level of managerial practice, the deployment of dynamic capabilities in Solway was noticeably different to AGS. The managing director was more operationally focussed (particularly on commercial and financial processes) and had less time to push through change events. Furthermore, as a larger organisation with clearly demarked functions, the management team at Solway was more intensely resourced than at AGS. A ‘traditional’ top down approach to change was evident and most events were initiated by the managing director and those that weren’t required his approval before implementation. As a consequence of his level of activity in operational matters though, the managing director tended to initiate change but then delegate the delivery to the management team, often with only occasional follow up at scheduled management meetings.

The approach adopted by Solway was more grounded in routine than in AGS. Whilst 50% of change events were characterised as an even blend of non-routine and routine

components, those that were not a 'balance' were more likely to exhibit a routine bias than agential bias approach. Several managers commented on the tradition which underpins "the way things are done" in Solway. Interview data suggests that whilst under family ownership (up until 2002), a highly autocratic top managerial approach was in place where deviation from routine was strongly discouraged and only very senior management were allowed to make decisions. Whilst two subsequent changes of ownership have distanced the organisation from that situation, as one manager described it, "the shadow of the old approach is still cast over the current operation". This statement was explained to mean that many of the current approaches are still conditioned by the previous ways of working in the organisation as whilst the ownership has changed, the vast majority of the employees have not. Typical manifestations of this way of working include a preference for protocol in communicating and implementing change, and the frequent espousal of political considerations when planning activity ("Better do it this way..."). Also, this view of the business explains why a number of the cases examined involved coaching and development of staff at all levels (e.g. 4a – IIP, 6b – Develop collaborative skills, 6c - install vocational training centre, 7b - management development programme).

Another difference between the contexts lies in how managerial capability development was approached. In Solway, the existing management team was being developed through a broad range of activities whereas in AGS, there was a far stronger emphasis on hiring in new management thinking. As such, the types of events reviewed in the Solway case reflect a higher level of managerial structure engagement. Operational level engagement was also far less frequent, partly because of geographical separation of staff members across sites and deeply entrenched operational staff views opposing change. Where changes were to be made at an operational level, they were typically bundled up as "all internal" events. Engagement with external structures was approximately equal between Solway and AGS as both were progressing with KTPs, subcontracting, Scottish Enterprise interactions etc.

The high level counts of structural views of events reviewed appear to suggest that in Solway the organisation was more likely to support change than in AGS. The author's experience of working with both organisations suggests that this view may be misleading as the higher proportion of managerial interactions with Solway skews the result. In Solway, as described above, managerial action tended to be influenced by political protocol and as a result, change was very often mooted in terms consistent with current practice (an incremental approach). With a tradition of compliance in the management team still strongly in evidence, the reapplication of familiar change approaches – regardless of effectiveness – was typically aligned with the views of the management team.

Quasi-statistical and Retroductive Analysis Comparative Summary

In brief, Solway was observed to be engaging in approximately the same types of change as AGS over the period of inquiry. There was a stronger emphasis on routine approaches in Solway which could be explained by the more established history of the organisation and a greater need to deploy/delegate activities on to staff. Relatedly, different managerial foci between the two contexts appeared to manifest in marginally lower levels of engagement and energy during deployment in Solway. A higher level of managerial structural engagement was seen in Solway – this structure tended to be responsive to changes for historical/political reasons.

These contextual comparative views emerged from the quasi-statistical and retroductive analysis – more specific comparison will be undertaken at the end of the chapter when the propositions are reviewed. Firstly, the remaining phase 2 outputs are briefly reviewed in a comparative manner.

Map of Influence

In addition to comparing the rich case data and quasi-statistics, a map of influence was compiled for the Solway events investigated as indicated in diagram 5.7. A similarity between Solway and AGS is noticed in the emergence of several 'hub' within case changes which are observed to exert influence on a number of other changes, instigating and/or absorbing learning outcomes.

Drawing on related rich data, it is observed that there exist differences in the nature of the hub events in Solway. In Solway, a formal strategy process is a central source of change triggers and repository of learning outcomes – the strategy document was collaboratively developed between managers and senior managers with external facilitation but was regularly reviewed and updated throughout the year. In line with the previously discussed political tendency in the management team to comply with change, managers were extremely mindful of attempting to meet outcomes against their name in the strategy document. Such an approach was not evident in AGS, where there was no formal strategy document or strategy development process.

Furthermore, the culture initiative championed by senior management was also supported by a high level of structure in the form of Investors In People documentation and process management. Whilst the scope of the culture initiative was slightly larger than the IIP initiative, the two aspects were closely related and mutually reinforcing. For example, particular events initiated under the progressive culture initiative could achieve a principal management approach resource adaption and subsequently contribute to IIP through a codification/formalisation of such a change. Equally, the best practice requirements of IIP (to pass an audit) could capture and more widely disseminate progressive management approaches which could subsequently be drawn on to initiate progressive culture related events. In the time period under empirical study, the deployment of lean initiatives was more loosely coupled to other culture initiatives. However, as organisational learning about lean approaches increased, particularly in senior management, through practice and engagement with external parties, its perceived importance as a future ‘hub’ initiative seemed to be growing. As a result, management discussions towards the end of 2009 appeared to be targeting a tighter coupling of lean initiatives to the strategy process as a mechanism for supporting a more austere approach to running the organisation, in line with environmental circumstances.

Map of Influence between Intentional Change Events – Solway Structural Steel

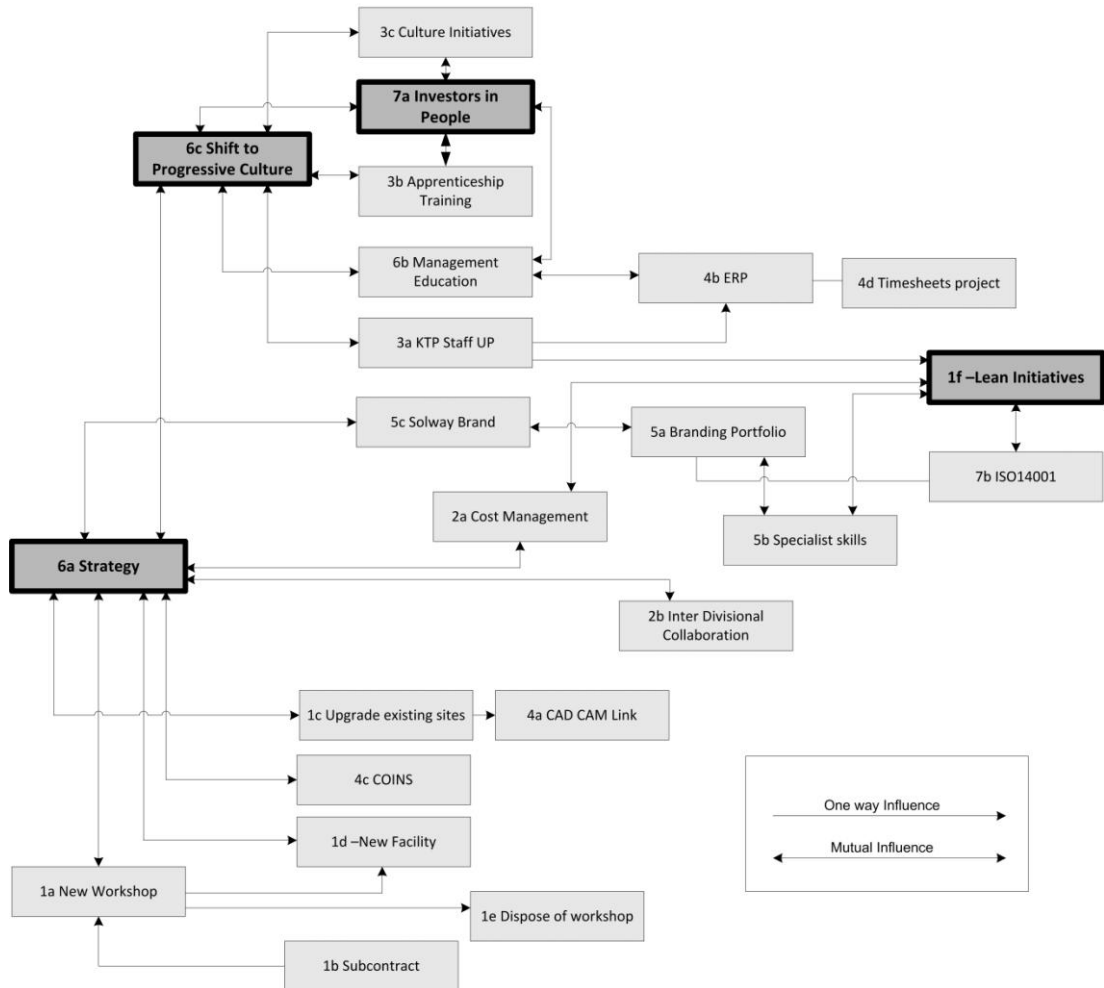


Diagram 5.7 – Solway Map of Influence

In comparison, in AGS there were very similar intentions expressed about achieving a progressive culture and deploying lean initiatives but with a much lower level of formalisation. Whilst a degree of routinisation was attempted, through the automation of aspects of business processes and the scheduling of regular meetings to review activities, there was less preponderance on codification of activities and target outcomes.

Across both contexts, it did appear that over time, deployments of dynamic managerial capabilities did exert significant influence on each other either directly through the previous outcomes of change events or indirectly through the accumulation of organisational knowledge / learning.

Concurrent Deployment Analysis

Cross-sectional analysis of the Solway context was conducted with the same caveats as in the AGS context (that this is a crude measure intended to provide a snapshot of events at different junctures but should not on its own represent an outcome- it requires corroboration). This analysis is represented in diagram 5.8 and chart diagram 5.9. Analysis of events at Solway suggests that over the course of 2009, the way in which dynamic managerial capabilities were deployed changed. Over the course of the year, a greater level of managerial attention was devoted to deployment and engagement levels increased slightly but in a fluctuating manner. Agential-biased approaches decreased slightly – routine approaches dropped noticeably between time periods 1 and 2 whereas a balanced approach increased by a similar amount.

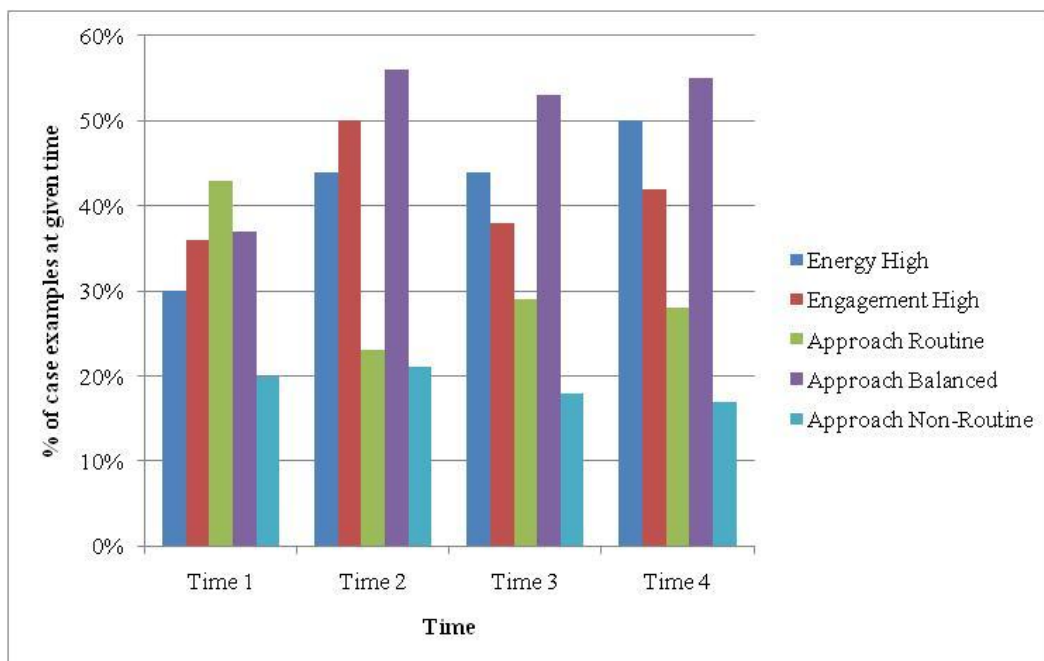


Diagram 5.9 - Solway Event analysis at periods in Jan-Dec 2009

These patterns are reflective of the changing circumstances of the business. Between time period 1 and 2 the effects of the recession and toughening market conditions really started to have an influence on the organisation. Firstly, managerial attention was diverted to delivering a number of changes as a matter of adaption and survival, hence the rise in energy devoted to deployment. Furthermore, the non-routine nature of the changes required increased the agential component present in change

approaches, prompting a move from routine biased approaches to more balanced approaches.

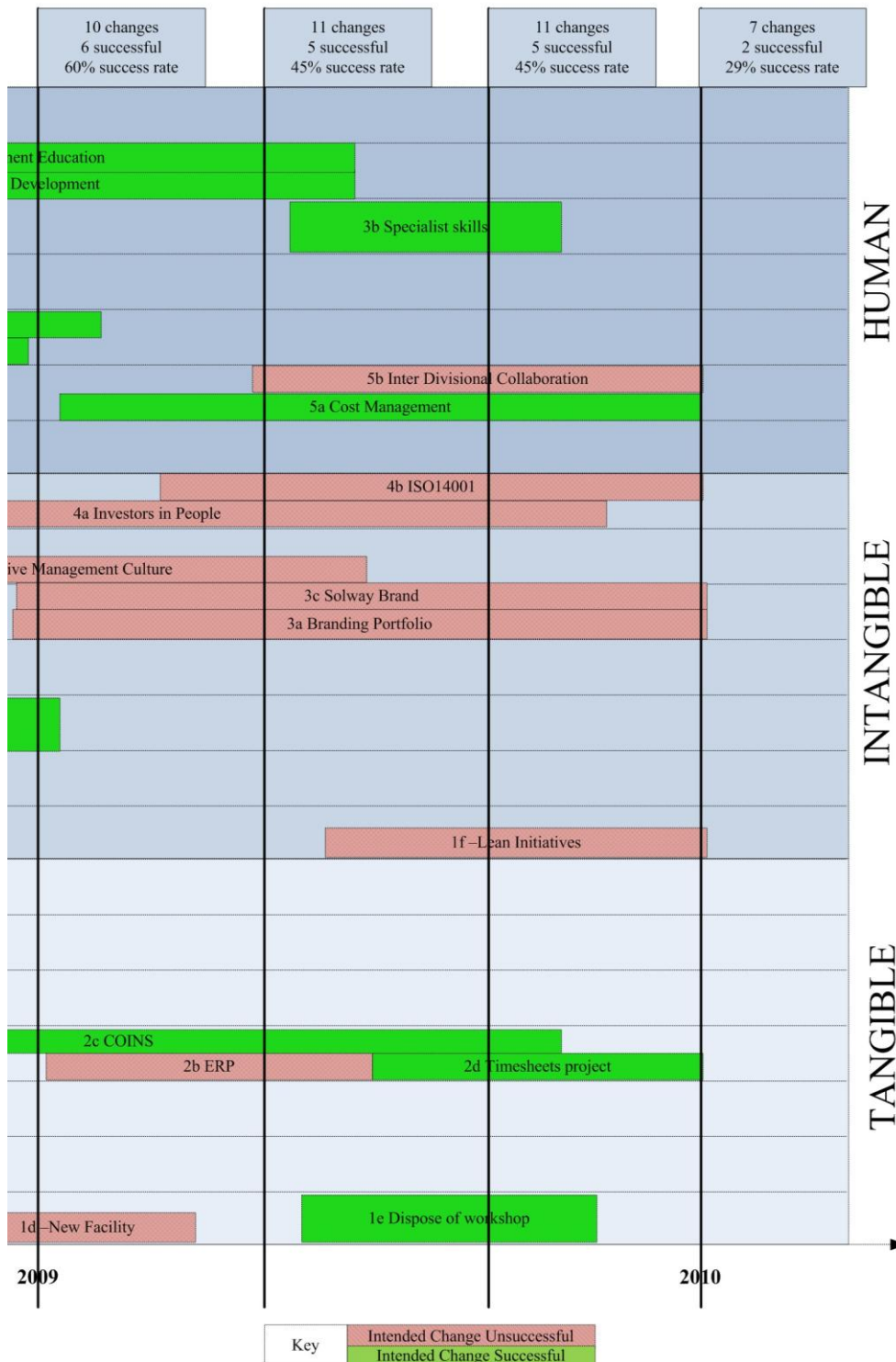


Diagram 5.8 - Solway Timeline of Change Events Jan-Dec 2009

The decreasing level of success of change initiatives over 2009 in Solway is strongly linked to the changing environmental circumstances of the organisation. As a result of significant reductions in sales turnover linked to market demand, the organisation had to effect a sharp contraction of its own resource base which was hugely demanding on managerial attention and emotional energy.

Summary of Sequential and Concurrent Deployment Findings

The Solway map of influence suggests that previous deployments can and do exert influence on future deployment events. Compared to AGS, Solway appeared to favour more formalised mechanisms for capturing learning, in particular through a structured, published company strategy. Long term cultural changes were observed to act as triggers to a range of related projects, as in the AGS case. The concurrent analysis showed a change in the profile of deployment practice as routine bias approaches appeared to be swapped for more balanced approaches against a backdrop of changing market conditions, dropping sales orders and a need for fiscal retrenchment. This is in contrast to the AGS context, which also suggested the profile of deployment approach changed but for different reasons.

Overall, this section so far has painted a picture of Solway as a case context which has a number of differences to that observed in AGS, despite the two organisations operating in the same sector and being geographically close. The findings of the phase 2 analysis of Solway are now directed towards analysis of the tentative research propositions.

Summary of Cross Case Comparison of Propositions for Replicability

This section presents a review of the replicability of the propositions generated in the AGS case in light of the findings of Solway. Tables 5.9-5.11 shows the results organised by replication type. As explained in chapter 4, literal replication is where a proposition is confirmed by similar findings being expected and observed in the second context. Analytical replication is where the same findings are not observed for theoretically expected reasons. In other words, mitigating factors are explained and when taken into account, an argument in support of analytical generalisation is

offered. Finally, propositions are refuted by the Solway case context where the data suggests the proposition is neither literally nor analytically replicable.

Literal Replication

ID	Description
P2	Intangible resource changes are the least likely to be executed successfully
P4	Initial clarity of outcome has a major impact on the likely success of the deployment of resource base change – where it is low, success is far less likely
P6	A high level of managerial attention increases the likelihood of deployment success
P7	A high level of managerial engagement with the affected structure increases the likelihood of deployment success
P8	A balanced approach to deployment is most likely to lead to a successful deployment event
P9	Different structures will exhibit different views of change events
P10	Structural opposition to change has a major negative impact on the likelihood of an event achieving its intended outcome
P11	Deployment of dynamic managerial capabilities is influenced both directly (in terms of outcomes achieved) and indirectly (in terms of experiential learning) by preceding deployments
P12	Deployments aimed at cultural change which occurs over time can act as ‘hub’ deployments which influence the deployment of and are influenced by the outcomes of shorter term related intended changes
P13	Streams of sequential deployments seem to influence each other in a complex way
P14	Managerial energy is in scarce supply and can constrain the successful deployment of dynamic managerial capabilities

Table 5.9 – Literally Replicated Propositions

In both case contexts, the findings appeared to literally confirm that intangible changes are the least likely to be successful and that a low initial clarity of outcome reduces the likelihood of a deployment event being successful. In terms of deployment, in both contexts it was observed that high levels of managerial energy and a balanced approach (in terms of routine/agential components) represented practice linked to more successful outcomes. Different engaged structures were seen to exhibit different views of change events in both case contexts; where this view was against change, the likelihood of a successful outcome was reduced. It was also observed in both case contexts that sequential deployments might influence each other in complex ways; longer term cultural/intangible changes acted as hub deployments triggering shorter term deployment events and indirect learning effects influenced subsequent deployments in addition to direct event resource base change outcome effects.

Analytical Replication

ID	Description
P1	Tangible resource changes are the most likely to be executed successfully
P15	The capacity to deploy dynamic managerial capabilities may in part be determined by the level of operational business of the organisation

Table 5.10 – Analytically Replicated Propositions

It is argued that proposition 1 was not literally replicated in the Solway case as several tangible resource change events were confounded by sharp market downturn. These exceptional circumstances had a mitigating effect as strategic plans shifted mid-deployment and the change deliberately did not transpire as initially intended. Give that prior to the shift in environmental conditions that 9/10 tangible resource changes were deployed successfully in the Solway context, analytical replication is argued for proposition 1.

Proposition 15 is also argued to be analytically replicated despite different literal effects being observed between the two contexts. P15 was developed in response to the observation in AGS that when the level of available managerial resource to

deliver change events ongoing was increasingly consumed by the needs of an overly busy direct operation, the capacity for change was reduced. In the Solway context, it was the exact opposite case where an underutilised operation and difficult market conditions required energy sapping retrenchment activities to be carried out. These also reduced the capacity for further changes although one might have conceived that reduced throughput of the operation might have increased slack managerial resource. The terms of P15 are argued to be replicated and learning is suggested that too high or too low a level of business of the direct operation might impact the capacity to deploy dynamic managerial capabilities.

Refuted Propositions

A number of propositions were also refuted on the basis of a lack of either literal or analytical evidence. P3 in the case of Solway was not found to be the case as modifications were more successful than extensions. P5 was refuted as in Solway routine biased approaches were seen to be more prevalent than agential biased approaches (under normal operating conditions). P16 was disconfirmed as the exact opposite findings were observed in Solway – routine approaches decreased as managerial energy was consumed as the agential components of change increased in response to environmental effects. The pattern suggested by P17 was not observed in the cross sectional analysis in Solway.

ID	Description
P3	Deletions, additions and extensions of resources are easier to achieve than modifications of resources
P5	“The situational demands of individual change events will contribute to different deployment practice approaches being exercised (as characterised by levels of energy, engagement and the balance (routine/non-routine) of approach)”
P16	Where managerial resource available for dynamic managerial capabilities deployment is limited, the level of routine approach adopted may increase for implicit efficiency reasons
P17	Concurrent deployments of dynamic capabilities might increase the number of successful change events completed in a period of time but will only do so with decreasing returns

Table 5.11 – Refuted Propositions

A broad range of propositions developed in the AGS context are literally or analytically replicated in the Solway contexts. How these propositions might be used to address the research sub-questions is addressed in the following section.

Research Findings

In a bounded way, this chapter has shaped a large volume of qualitative data into tentative findings to the sub-questions identified in chapter 3, as presented below.

How do the necessary factors of dynamic managerial capabilities deployment affect purposeful change to the resource base?

In general, the practice of dynamic managerial capabilities was seen to be messy and imperfect - partly limited by the characteristics of the deploying manager and partly mitigated by the status of a near infinite range of contingency factors. When considered in abstract terms as prescribed by the conceptual framework of necessary factors, all factors were shown to have influence, although it appeared that not all factors were of equal influence.

Of the intended change factors identified, the most influential on the potential success of resource base change was the **initial clarity of outcome**. Effectively, the better able the deploying manager was able to articulate the nature of the change, the more likely it was to succeed. Relatedly, it was proposed that tangible resource changes are more likely to succeed than intangible resource base changes.

In considering the necessary factors of deployment, a high **level of managerial energy** afforded to a deployment event after initiation is seen to improve the likelihood of success. Equally, a high **level of managerial engagement** with the affected structure is also seen to improve the chances of intended outcomes being delivered. Furthermore, **a balance of agency and routine** appeared to be the most generally successful approach to deploying dynamic managerial capabilities.

Reviewing the analysis of structural context factors suggests that the **views of engaged structures** vary between events and where opposed to the intended change,

they can exert a substantial negative influence on the likelihood of success. Also revealed was that different engaged structures react to deployment events in different ways – external and managerial structural engagements tending to be more successful than operational or ‘all internal’ events.

How do sequential deployments of dynamic managerial capabilities interact?

Analysed at the level of within case examples, findings suggest that streams of sequential deployments seem to influence each other in a **complex** way. Drawing on the necessary factors from the conceptual framework, deployment of dynamic managerial capabilities is influenced both **directly** (in terms of outcomes achieved) and **indirectly** (in terms of experiential learning) by preceding deployments. Also noted was that an initiative intended to deliver **cultural change can act as a deployment ‘hub’** (being enacted slowly over time), influencing the deployment of and being influenced by the outcomes of shorter term related intended changes

How do concurrent deployments of dynamic managerial capabilities influence each others?

Cross-sectional analysis of concurrent deployments of dynamic managerial capabilities suggests that **managerial energy is in scarce supply** and can constrain the successful concurrent delivery of intended change. The case contexts, in different ways, suggested that the available level of managerial energy can be influenced by contingent factors and in particular, the capacity to deploy dynamic managerial capabilities may in part be determined by the level of operational business of the organisation.

These findings, supported by case data from AGS and Solway, have the potential to be shaped into a contribution to knowledge through further reflection and analysis. According to Whetten (1989, p483), borrowing a perspective from another field “encourages altering our metaphors and gestalts in ways that challenge the underlying rationales supporting accepted theories” – this activity “generally precipitates a broad reconceptualisation of affected theories”. In pursuit of a contribution to knowledge, the next chapter endeavours to add depth the research findings by reviewing them from a further theoretical perspective.

Chapter 6 – Analysis from a Strategy as Practice Perspective

“Strategy is something that people do... engagement with Strategy as Practice can offer a deeper level of explanation for some of the major strategic issues traditionally researched in strategy”

Johnson, Langley, Melin and Whittington, 2005 pp 4-5

Chapter Abstract

This chapter's aim is further develop the research findings through analysis from a Strategy as Practice (SAP) perspective. This perspective is selected in response to calls from literature, needs relating to the intended contribution of this thesis and the stated interests of the author.

The application of a SAP perspective is explained as providing an analytical focus on what managers actually do in relation to their context and the situational needs of the intended activity under investigation. Firstly, critical realist social theory is drawn on to map four configurations of dynamic managerial capabilities deployment practice. These configurations are then used to derive further analysis of overall deployment approaches from the empirical case data reviewed in chapter 5. Drawing from the qualitative analysis, activity systems diagrams are presented to describe four different approaches to the practice of dynamic managerial capabilities.

These are described as:

- Prosecutionary Practice - The manager drives through change with little cognisance of the views of the engaged structure
- Persuasive Practice - The manager drives change collaboratively, investing time in engaging with the affected structure
- Enabling Practice - The manager invests in engagement to direct the affected structure to use its energies to deliver an outcome
- Endorsing Practice -The manager signs off on change but thereafter provides only minimal functional support when prompted by the affected structure, effectively leaving it to deliver the change under its own direction

The situational requirements of different change events are also modelled around the needs of the affected structure. Drawing on the findings of chapter 5 and practice literature, these are suggested as the affected structure:-

- Needs Told – Engaged structure against the change but doesn't resist outcomes once managerial decree issued
- Needs Sold - Engaged structure against the change and resists ongoing even when target outcome backed by managerial fiat
- Needs Steered – Engaged structure for the change but needs regular direction to build understanding of the intended outcome
- Needs Oriented– Engaged structure for the change and needs only initial direction to deliver towards the intended outcome

Drawing on analysis derived from chapter 5, the efficacy and efficiency of different deployment practices are discussed. The analysis suggests that to maximise the technical and evolutionary fitness of their dynamic managerial capabilities, managers must adopt a situational approach to deployment. Failing to do so will either increase the likelihood of deployment events failing to deliver the intended outcome or achieve the intended change at a cost which increases vulnerability in the face of more efficient (internal or external) competition.

Targeted contribution 1 – Theoretical Development

According to Pablo et al (2007 p690), “there is a noticeable lack of research addressing the micro-process question of ‘how’ managers or organizations can enable dynamic capabilities and improve the organization’s ability to perform”.

Other authors such as Regnér (2008), Ambrosini and Bowman (2009) and Maklan and Knox (2009) suggest that a valuable contribution to knowledge can be made through empirically informed development of dynamic capabilities ‘practice’ theory. This thesis aims to make such a contribution at the level of managerial practice, as distinct from organisation or institutional level which may be examined separately (Johnson et al, 2005)

As recommended by Whetten (1989), to shape empirical research findings into a contribution to knowledge with explanatory depth, an alternative theoretical perspective can be applied - a strategy as practice view is adopted for such an activity in this thesis. Strategy-as-Practice is a theoretical perspective which, like dynamic capabilities, is in an early stage of development in the field of strategic management – it is a theoretical view based on the premise that strategy is something which managers do rather than something an organisation has (Jarzabkowski, 2005). According to Regnér (2008, p567), this includes “what actors do and work with” when managing strategy.

There are several reasons for electing to consider the research findings from this perspective. Firstly, there appears to be an alignment between the elements of the conceptual framework and strategy as practice, defined by Johnson et al (2005, p7) as “what people do in relation to strategy and how this is influenced by and influences their organisational and institutional context.” Johnson et al (2005, p7) further explain that a Strategy as Practice perspective “places human interaction at its centre”. This notion aligns with the conceptual framework of this thesis which offers a view on how managers attempt to deliver purposeful strategic change to the resource base through engagement with a relevant internal or external societal structure. As such, a Strategy-as-Practice perspective should be able to offer a view of the research findings regarding how the activities of dynamic managerial capabilities deployment are “influenced by and influence their organisational and institutional context”

Secondly, it could be argued that the research findings present, in a bounded way, the details of the “interactions of actors, contexts, cognitive frames, structures and artefacts” (Regnér, 2008, p575) required to study an organisation’s dynamic capabilities from a Strategy-as-Practice perspective. Ambrosini and Bowman (2009, p46) suggest that applying a strategy as practice perspective may enable a researcher “to obtain some concrete evidence of what dynamic capabilities look like in organizations, how they are deployed, and how context may impact upon them.”

Regnér (2008, p584) also suggests that a research challenge is to “map empirically different types of activity configurations over time, and determine their specific character, as well as any similarities and differences between them and between the configurations of different organizations in the build-up of organizational assets.”

This challenge is addressed as a means to explore how dynamic managerial capabilities are deployed from a Strategy-as-Practice perspective. To do so, further analysis of the research findings is undertaken to identify deployment activity configurations which are then represented through activity system diagrams. This is in line with the approach used by Jarzabkowski (2005) in qualitatively modelling the strategy processes adopted in different circumstances across three longitudinal case contexts.

How can we model the research findings from a practice perspective?

According to Jarzabkowski (2005, p21), strategic managerial activities are ‘situated’ in a social context. This is consistent with the views developed in the conceptual framework in this thesis and also the espoused view of Ambrosini et al (2009, pS20). As described in chapter 3, the deployment of dynamic managerial capabilities necessarily entails the engagement of management with some form of social structure in the creation, extension or modification of aspects of the resource base. Accordingly, social theory can be used to inform exploration of the research findings from a practice perspective.

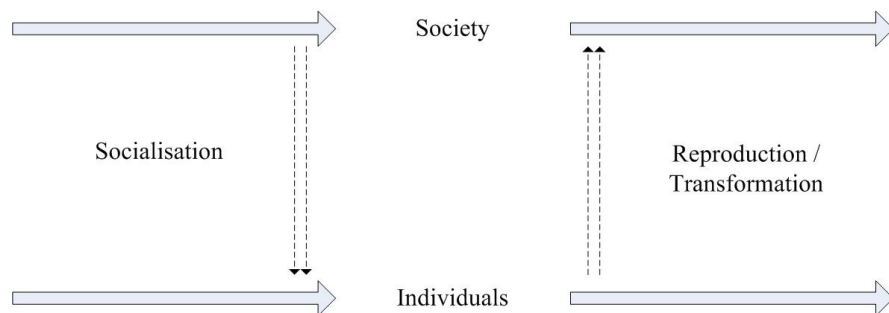


Diagram 6.1 – Transformational Model of Social Activity (Bhaskar, 1998)

Critical realist social theory holds that just as social structures rely on human activity (social agency), society is the material setting for humans to conduct meaningful activity, pre-existing any such efforts and influencing their form through the causal

mechanisms of social structures (Outhwaite, 1987). These notions describe a dualism between social agents and social structures – “Society provides necessary conditions for intentional human action, and intentional human action is a necessary condition for it“ (Bhaskar, 1998, p216) captured in the “transformational model of social activity” illustrated in figure 6.1.

This model mainly aligns with structuration theory as espoused by (Giddens, 1984) but according to Bhaskar (1998), is more explicit about the ontological distinction between individuals and society. The implication from a critical realist perspective is that whilst society can be considered a real object, it is different in nature and activity to individuals (just as water is different in nature and activity to hydrogen and oxygen). The process of how individuals interact with a societal structure (referred to as socialisation above) is therefore quite different to individual to individual interactions and must be studied as such (Archer, 1995).

Related to the dynamic managerial capabilities deployment events examined in this thesis, critical realist social theory is drawn on to make some initial important clarifications. The ‘engaged structure’ described in the empirical data represents the societal conditions for action and the individuals are the instigating managers at the centre of the conceptual framework. Relating to the processes of interaction, the outcomes of the event will determine either a reproduction of existing conditions or a change being realised.

Furthermore, as outlined in chapter 2, dynamic managerial capabilities are dissipative. That is to say, they necessarily require time and effort to be invested to achieve the intended outcome although the level of effort and time required for an event is wholly contingent on the circumstances, as suggested by authors such as Lavie, (2006); Pablo et al, (2007) and Ambrosini and Bowman, (2009). Furthermore, applying a transformational model of social activity to extant dynamic managerial capabilities literature does not imply that the instigating manager need make the change alone – whilst they may initiate activity towards the intended outcome, other actors may be drawn in to effect a change (Archer, 1995; Mutch, 1999).

Drawing these concepts together, it is possible to represent dynamic managerial capabilities deployment events as the elements in the template diagram 6.2.

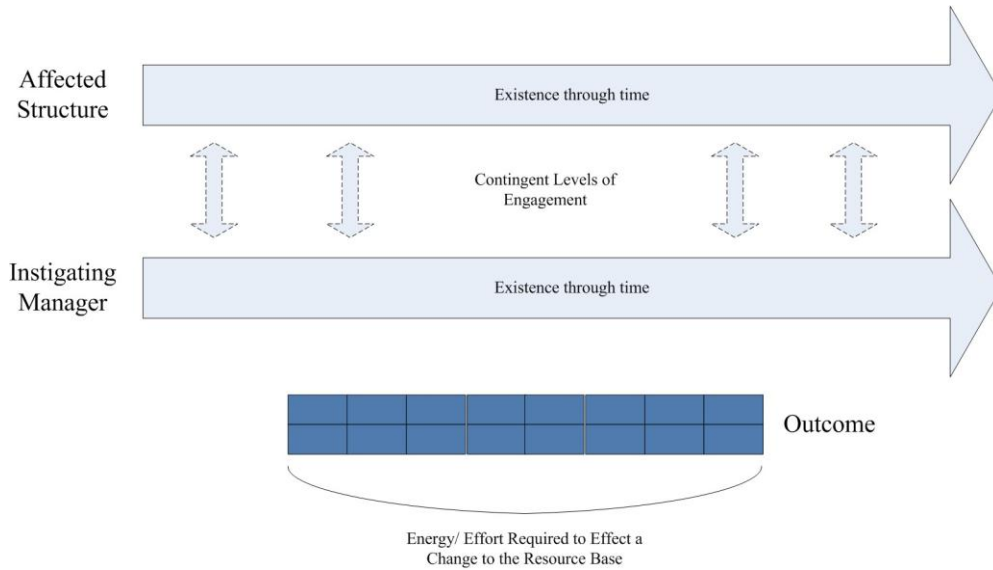


Diagram 6.2 – Deployment Activity Configuration Template

Diagram 6.2 represents the template for a thought experiment intending to visually depict how the effort required to deliver a particular intended change to the resource base might be achieved. Firstly, the energy or effort to deliver a particular outcome is conceived of as a total amount, comprised of an arbitrary number of sub-elements (between change events, the amount of effort required will differ according to circumstance and who actually delivers the effort can also vary). When totalled, the sub-elements in this conceptualisation represent the complete amount of effort which needs to be dissipated over time in order to deliver the intended outcome.

The conceptual framework in diagram 3.4 characterised the use of managerial resource in terms of managerial engagement and managerial energy. Different combinations of high and low levels of each were observed through the course of the empirical investigation, which are now considered in turn and modelled using the template presented in diagram 6.2 (the impact of agency/routine blends is addressed later in the chapter). The aim of this endeavour is to move towards a practice-oriented view of the research findings by first visually presenting how change events, intentionally instigated by managers, were attempted in the cases examined.

High Energy Low Engagement

The first configuration of energy and engagement examined is the situation where the instigating manager contributed the majority of the energy required to deliver the outcome and did so in a manner characterised by low interaction/engagement with the affected structure. The practice of adding or removing human resources (AGS theme 6) is an example where the instigating manager would invest the required energy to make the change happen but would engage with the affected structure in a minimal way. Diagram 6.3 is a conceptual representation of this approach to deploying dynamic managerial capabilities.

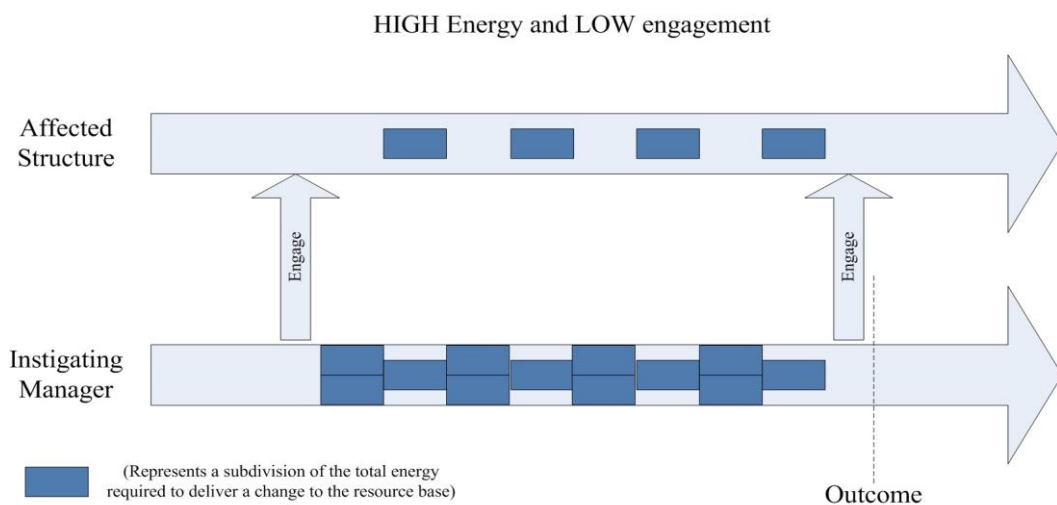


Diagram 6.3 – High Attention, Low Engagement Activity Configuration

The instigating manager defrays the majority of the energy required to make the change and therefore has a high level of influence over the form of its outcome. When engagement with the structure happens, it is infrequent and typically one-way as the engaged structure has little influence over the nature of the outcome. Through this approach, the manager uses the power of their position within the social structural context of the organisation to push through the change.

High Energy High Engagement

The second configuration considered is where the instigating manager contributes the majority of the energy required to make a change and engages frequently with the affected structure whilst doing so. The delivery of the stores layout project in AGS (within example - 3c) is an example of where the instigating manager contributed a

high level of energy and engaged with the affected structure throughout the delivery of the intended change, as represented in diagram 6.4.

(HIGH energy and HIGH engagement)

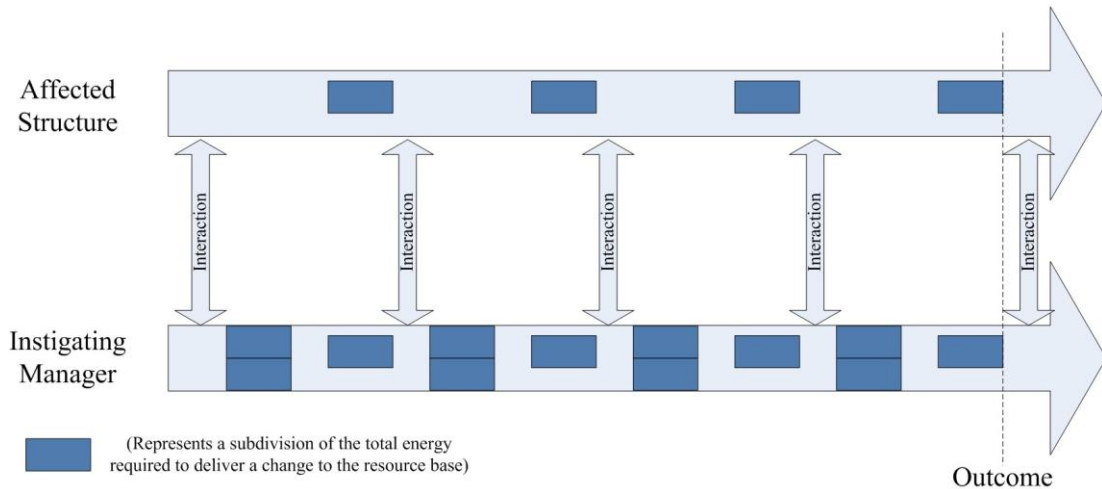


Diagram 6.4 – High Attention, High Engagement Activity Configuration

In this form of change, engagement with the organisation is frequent and two-way – the instigating manager is open to feedback and the affected structure influences the form of the outcome delivered although the manager still inputs a high level of energy to make the change happen. An advantage of this approach is that a feedback loop is introduced between the manager and the structure which can be used to influence activity and approach on a frequent basis. Relatedly, the manager has to invest high levels of scarce energy and time to enact this form of deployment practice.

Low Energy High Engagement

As indicated in the previous section, the instigating manager does not necessarily have to expend the majority of the energy required to deliver an intended outcome. The cultural initiatives and systems improvement work at Solway are examples of the instigating manager interacting frequently with the affected structure but the majority of energy to make the change being provided by the affected structure itself, as illustrated in diagram 6.5

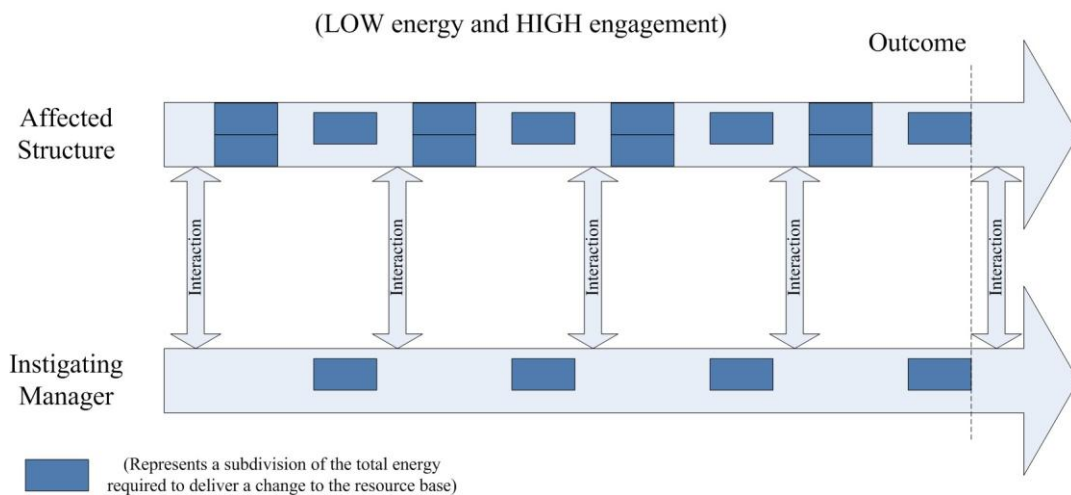


Diagram 6.5 – Low Attention, High Engagement Activity Configuration

The engagement is two way and frequent, providing regular feedback as to progress and has the advantage of allowing the manager to steer the change without actually investing their energy into delivering the change on a daily basis. Conversely, the manager loses some control over how the change event is executed which may have consequences for the delivery of the outcome if the engagement process is compromised for any reason.

Low Energy Low Engagement

Finally, it is wholly possible for a manager to use their position to initiate an event but to contribute little of the energy required to make it happen and to engage in a minimal way with the affected structure. The establishment of the professional meeting area (3n) in AGS and the set-up of the CAD-CAM link (2a) at Solway are examples of changes where the manager gives approval for a concept to be delivered by delegates, provides minimal engagement and energy until an outcome is delivered as illustrated in Diagram 6.6

In this configuration, the effort of the manager is typically directed towards carrying out basic managerial functions, such as making the necessary tangible or human resource allocations for a change. This can represent an efficient use of the manager's time if the affected structure is clear on the outcome to be achieved. Equally however, the manager cedes control of the change to the organisation and

with minimal engagement with the affected structure, the manager has little visibility of progress.

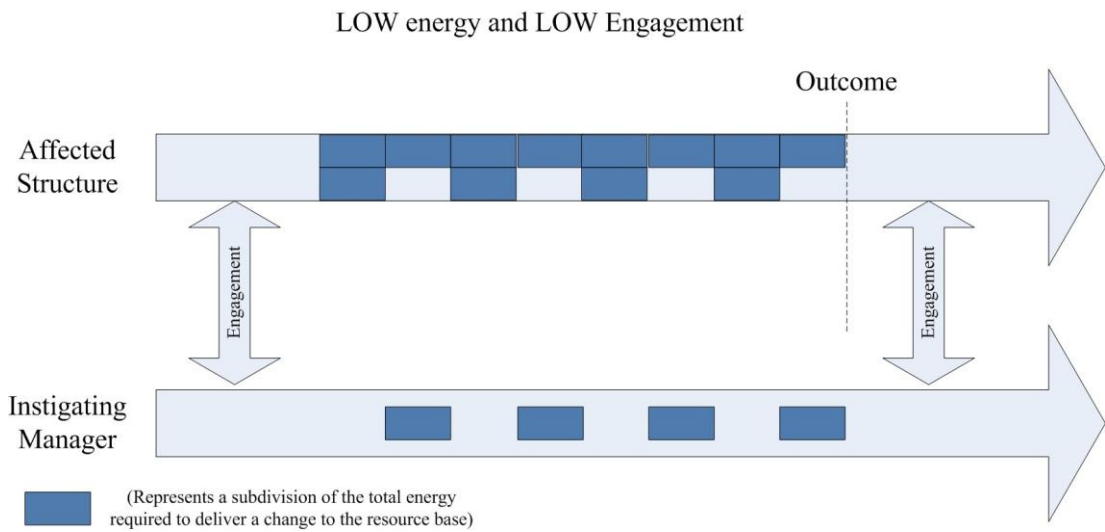


Diagram 6.6 – Low Attention, Low Engagement Activity Configuration

So what are the implications?

Diagrams 6.3-6.6 are arguably a rudimentary representation of different approaches to the practice of dynamic managerial capability deployment. They show configurations of the use of managerial energy and levels of engagement with an affected structure in moving towards an intended change to the resource base. But what are the consequences of these different configurations? Do they have any impact on the success of change in different circumstances? If so, what are the relevant situational merits of each approach to deployment practice?

To address these questions, a derivative of the quasi-statistical analysis from chapter 5 is offered in diagram 6.7 as a starting point. In diagram 6.7, the columns represent the different configurations of energy and engagement shown in diagrams 6.3 – 6.6, the rows present details of the remaining elements of the conceptual framework and each entry in the table describes the % success of the intended change event. The findings from each case context are presented side by side.

		ENERGY		High		High		Low		Low	
		ENGAGEMENT		Low		High		Low		High	
		Context		Solway	AGS	Solway	AGS	Solway	AGS	Solway	AGS
OVERALL SUCCESS		72%	83%	100%	93%	56%	39%	67%	100%		
RESOURCE TYPE	TANGIBLE	83%	88%	100%	88%	50%	86%	83%	100%		
	INTANGIBLE	43%	50%	100%	88%	64%	36%	56%	100%		
	HUMAN	100%	80%	100%	100%	53%	24%	67%	100%		
CHANGE TYPE	ADD	83%	80%	100%	95%	53%	54%	73%	100%		
	DELETE	80%	100%	n/a	n/a	n/a	n/a	n/a	100%		
	MODIFY	60%	82%	100%	86%	55%	22%	67%	100%		
	EXTEND	50%	n/a	n/a	100%	63%	57%	50%	100%		
CLARITY	HIGH	92%	94%	n/a	87%	88%	89%	57%	100%		
	LOW	33%	50%	100%	96%	24%	24%	70%	100%		
SOCIETY	EXTERNAL	55%	86%	100%	93%	83%	100%	100%	100%		
	MANAGERIAL	100%	100%	100%	93%	71%	50%	65%	100%		
	OPERATIONAL	100%	100%	n/a	100%	0%	15%	n/a	100%		
	ALL INT	100%	50%	100%	67%	22%	33%	67%	100%		
ORG VIEW	FOR	57%	91%	100%	100%	40%	56%	67%	100%		
	AGAINST	75%	67%	100%	88%	33%	6%	33%	100%		
	AGNOSTIC	86%	100%	100%	100%	86%	82%	78%	100%		
APPROACH	AGENCY	100%	67%	100%	92%	79%	33%	88%	100%		
	ROUTINE	60%	83%	100%	78%	0%	46%	17%	100%		
	BALANCE	50%	91%	n/a	100%	80%	38%	50%	100%		

Key	Visual Indicator Colour
	<=33% - Low Success Rate
	33-67% - Medium Success Rate
	>=67% - High Success Rate

Diagram 6.7 – Comparison of Energy/Engagement Configurations

The visual indicators in the diagram suggest that using high engagement and high energy in concert yields the highest levels of success across change types and equally, low engagement and low energy typically yields the lowest likelihood of

intended change being delivered. The hybrid approaches, where High/Low and Low/High combinations of energy and engagement are deployed, appear to be effective in different circumstances, with the success rate varying between the two organisational contexts.

Reviewing the quasi-statistical outcomes across contexts, one might draw the conclusion that deploying dynamic managerial capabilities is simply a matter of adopting a high energy, high engagement approach to maximise the chances of deployment success. However, several further considerations indicate that this may not be the case. Firstly, a high energy, high engagement approach is the most intensive form of managerial resource usage. Reflecting on the Penrosian principle (Penrose, 1959; Mahoney, 1995) that managerial resource scarcity will limit the growth potential of the organisation, adopting a high energy, high engagement approach will arguably **minimise** the amount of managerial deployments possible. Secondly, in certain circumstances, different deployment configurations appear to be equally as effective as high energy, high engagement approaches but are less demanding in terms of either managerial time or energy. As such, the high energy, high engagement configuration will frequently represent an **inefficient** deployment approach in many circumstances. Over time in a competitive (inter-manager, team or organisation) situation, repeated application of a less efficient approach than competitors could have a damaging effect.

Thirdly, drawing on Foss' study of Oticon (2003) and Hamel's (2007) review of Google and Goretex, even in organisational contexts renowned for innovative, progressive approaches certain decisions made about the resource base cannot be immune from structural agency concerns. As such, the **efficacy** of different activity configurations might be described as situational or contingent. For example, in matters relating to the dismissal of employees, certain approaches to enacting resource base change may be rendered inappropriate by legal obligations. Finally, it cannot be assumed that the instigating manager has the requisite expertise to execute an intended change in every situation and therefore the **viability** of a high energy approach is not always assured.

With these points in mind, greater attention must be paid to the system in which the activity of deployment is enacted so as to better understand the situational advantages and disadvantages of the different configurations.

Activity Systems Diagrams

Treating the conceptual framework as a deployment activity system, diagrams can be constructed from the empirical data to represent “mediated interaction between actors and their social community in the production of shared activity”(Jarzabkowski 2005, p35). Such activity system diagrams provide a more detailed view of the dynamics of interaction between the elements of the conceptual framework in different activity configurations. Understanding the different dynamics in light of the available rich empirical data should enable greater insights to be gained about the practice of dynamic capabilities.

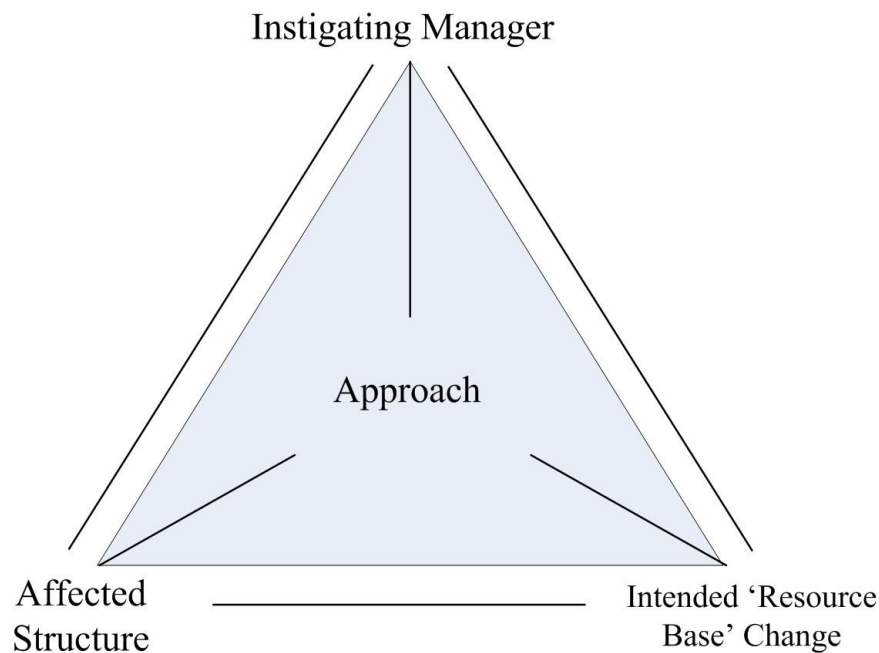


Diagram 6.8 – Activity System Template

Diagram 6.8 shows the template for a dynamic managerial capability deployment activity system. The instigating manager is the subject of the activity system and the affected structure a necessary object engaged in moving towards the intended resource base change outcome. The interaction between each element will be in part

shaped by the approach adopted. Furthermore, the approach adopted may well be shaped by the nature of the different elements (views of the structure, characteristics of the manager, nature of the intended change). These interactions and influences are represented by the lines on the diagram.

In each activity configuration presented in diagram 6.3-6.6, elements of the system will play different roles in terms of influence and interaction. Where an element plays a relatively influential role in an activity configuration, it will be represented in bold and the directionality of relationships between elements can be represented using arrows (two-way, one-way or negligible interaction).

By drawing on a combination of the quasi-statistics in diagram 6.7 and the research findings and analysis presented in chapter 5, the different configurations of activity systems can be represented diagrammatically.

High Energy Low Engagement - Prosecutionary Practice

Where high energy and low engagement are in evidence, the practice is labelled as prosecutionary. This reflects the central role of the manager in driving through change where the influence of their own views is strong, their approach has a significant impact on the intended change and the clarity of the nature of the intended change has an influence on likely success. As there is no influential feedback loop between the structure and the manager, the mediating relationship between the intended resource base change and the manager gains importance. The engaged structure plays a passive role – change largely happens to it, its members receive mainly instructional engagement from the instigating manager and there is little opportunity for it to influence the practice approach.

For example, when managerial human resources were being added to AGS, the change event was initiated and executed by the MD. Opinion was not sought from the managerial system as to how recruitment should be conducted (no influence on approach) or what type of individual should be sought (no influence on intended change), although there was a memo issued at the instigation of the change prior to advertisement (one way communication from manager to structure). Instead, the MD

adopted his own approach, which in turn influenced who was identified as potential candidates and the candidates' (representing options for the "intended resource base change") interactions with the MD shaped the eventual outcome achieved (two way influential engagement). The new hires were then added to the managerial system by decree of the instigating manager once a contract was signed (intended change influencing the affected structure).

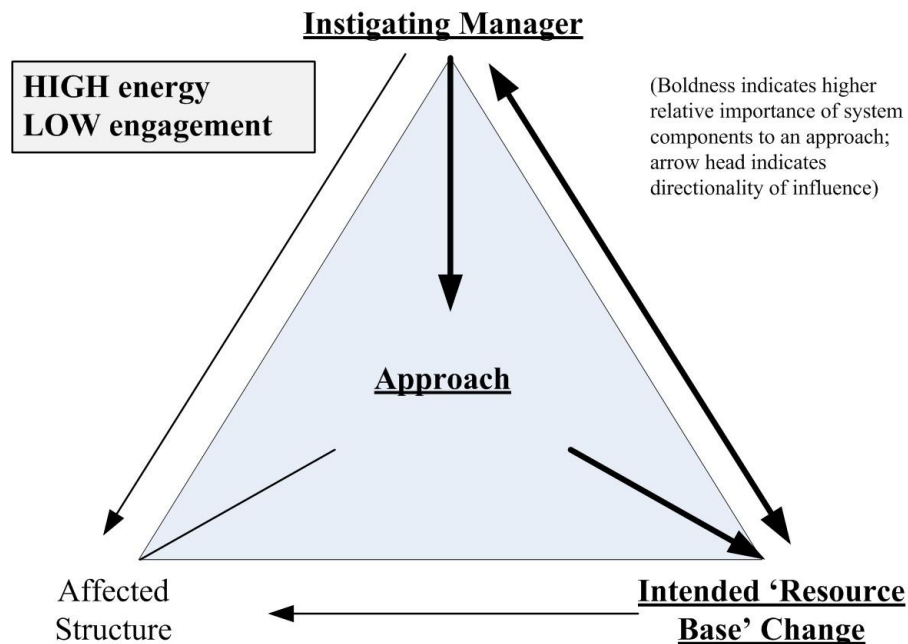


Diagram 6.9 – Prosecutionary Practice Activity Systems Diagram

High Energy High Engagement - Persuasive Practice

A high energy and high engagement approach is labelled as a persuasive practice. This reflects the high level of engagement between the affected structure and the instigating manager to deliver an intended outcome which may well be shaped by such interactions – this practice configuration allows both the manager and the affected structure to influence each other's views. However, whilst the engaged structure contributes to the delivery of the outcome, the instigating manager provides the majority of the drive and energy. The actual approach adopted is of lower influence in this configuration as the influential engagement of the manager and structure may result in an adaptive approach. Furthermore, the form of the intended change may be shaped by the interactions between the manager and the affected structure.

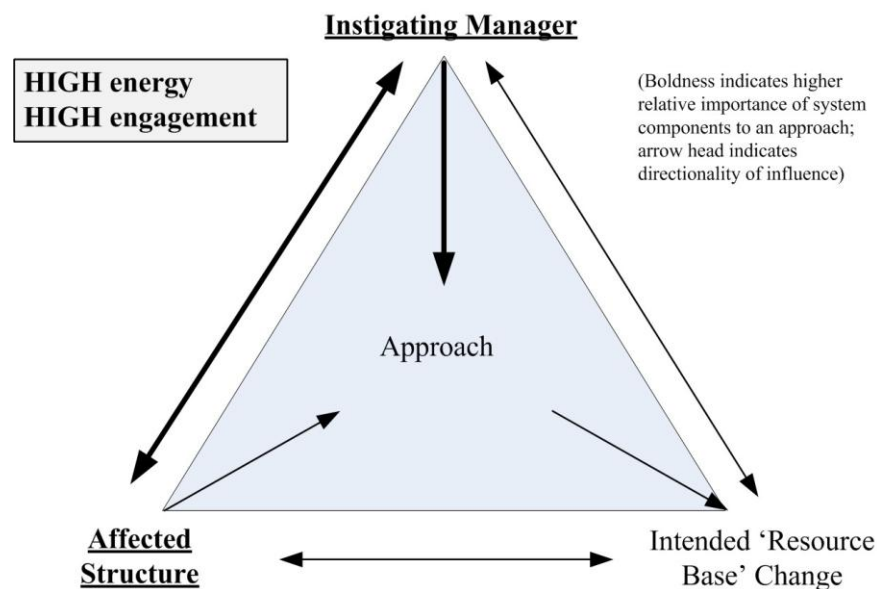


Diagram 6.10 – Persuasive Practice Activity Systems Diagram

The reconfiguration of the stores layout project (AGS within case 3c) is an example of such an approach being deployed. It was initiated by the MD but involved, over the course of about two weeks, every member of the organisation (an “all internal” deployment). The organisation and the MD engaged on a daily basis (influential two way engagement) to plan and execute the change (via an adaptive approach) with the exact form of the final outcome (low influence throughout change) representing a hybrid of the views of both the instigating manager and the organisational participants (influence of manager and affected structure views). Whilst the physical effort to reconfigure the stores was shared amongst the participants, the instigating manager delivered related tasks such as arranging required funding and providing reward and recognition incentives.

Low Energy High Engagement - Enabling Practice

A low energy and high engagement approach is described as an enabling practice as through high levels of engagement but low energy levels, the instigating manager facilitates and directs the engaged structure to deliver the intended change.

Accordingly, the managerial engagement with the affected structure, and the structures interactions with the object of change are key influencers. The intended resource base change shapes the approach adopted by the affected structure and equally is influenced by the approach adopted. The instigating manager doesn't

engage directly with the intended change, instead seeking to influence the views of the affected structure and contributing in a lesser way to the approach adopted.

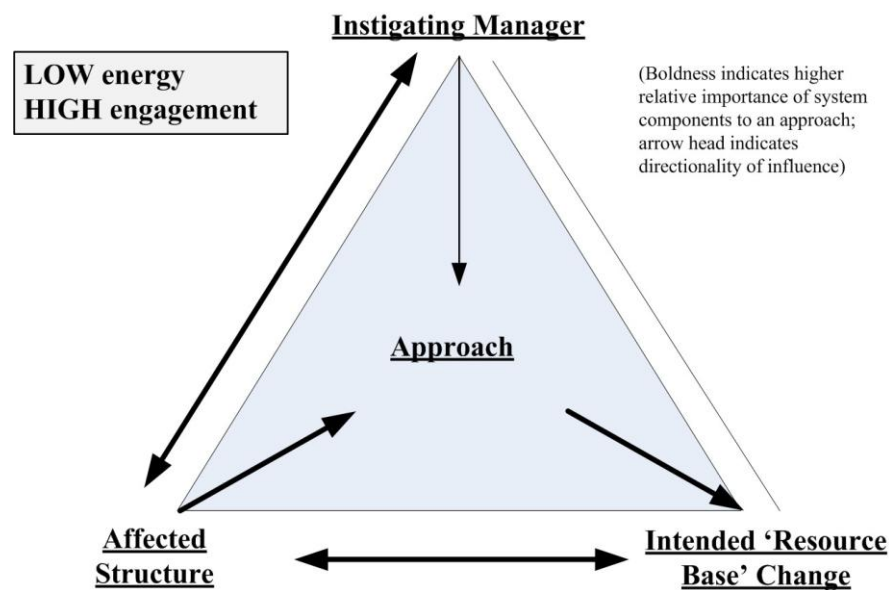


Diagram 6.11 – Enabling Practice Activity Systems Diagram

The workshop expansion at Killoch (Solway example 1a) is an example of this approach in practice. The instigating manager would regularly engage with the project team (comprising those who would eventually use the facility) charged with implementing the change, providing guidance and completing managerial functional tasks (e.g. resource allocation) when required. The approach adopted in delivering the change was largely determined by the affected structure, and influenced the format of the outcome delivered. Equally, as deployment progressed, the intended change also influenced the approach adopted by the affected structure.

Low Energy Low Engagement - Endorsing Practice

A low energy and low engagement approach is labelled as an endorsing practice to reflect the most 'hands-off' type of practice configuration, effectively relying on managerial fiat to deliver an adjustment to the resource base. Aside from initiating the change, the instigating manager devolves the delivery to the affected structure and accepts information when offered. They offer no real input to its enactment although they do offer minimal functional support (e.g. allocating necessary financial resources) when prompted. The nature and clarity of the intended outcome have an influential bearing on the likelihood of success.

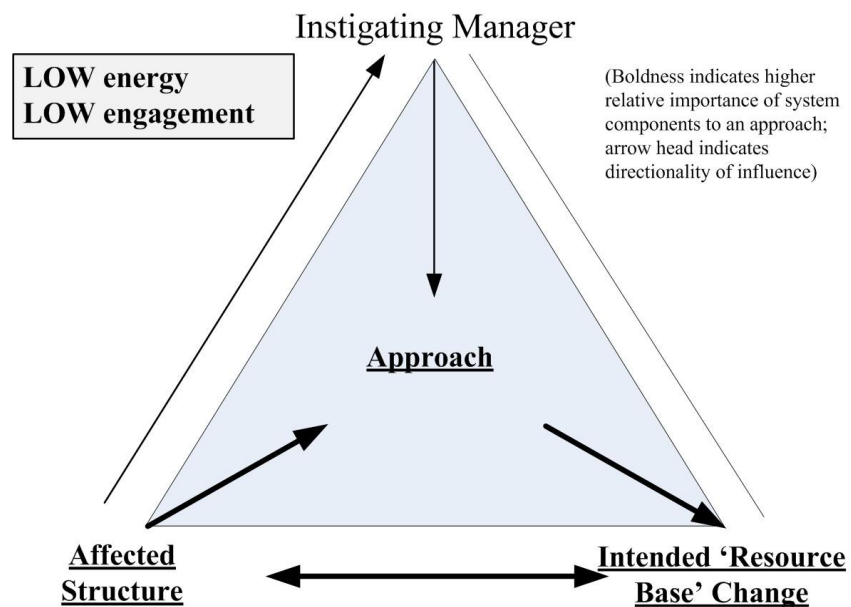


Diagram 6.12 – Endorsing Practice Activity Systems Diagram

The implementation of the professional meeting area in AGS (case 3n) is an example of this practice being deployed. After initiating this change, the MD's only involvement before starting to use the facility was to approve the necessary expenditure when prompted by the manager charged with making it happen. The form and function of the outcome influenced and was influenced by the engaged structure – in turn determining the approach adopted to deliver the change.

Practice Approach Summaries

Based on the application of a strategy as practice perspective to the research findings, diagram 6.13 offers representations of different configurations of dynamic managerial capability deployment practice. Drawing on analysis from chapter 5, they represent a response to Regnér's (2008) challenge to map empirically different activity configurations.

What is not clear at this juncture however is whether or not these configurations vary in applicability in different contexts. Are there any inferences that can be made, drawing on theory or the empirical findings of chapter 5, about where or how these different configurations should be used? The next section aims to explore the influence of context on the selection of appropriate deployment practice.

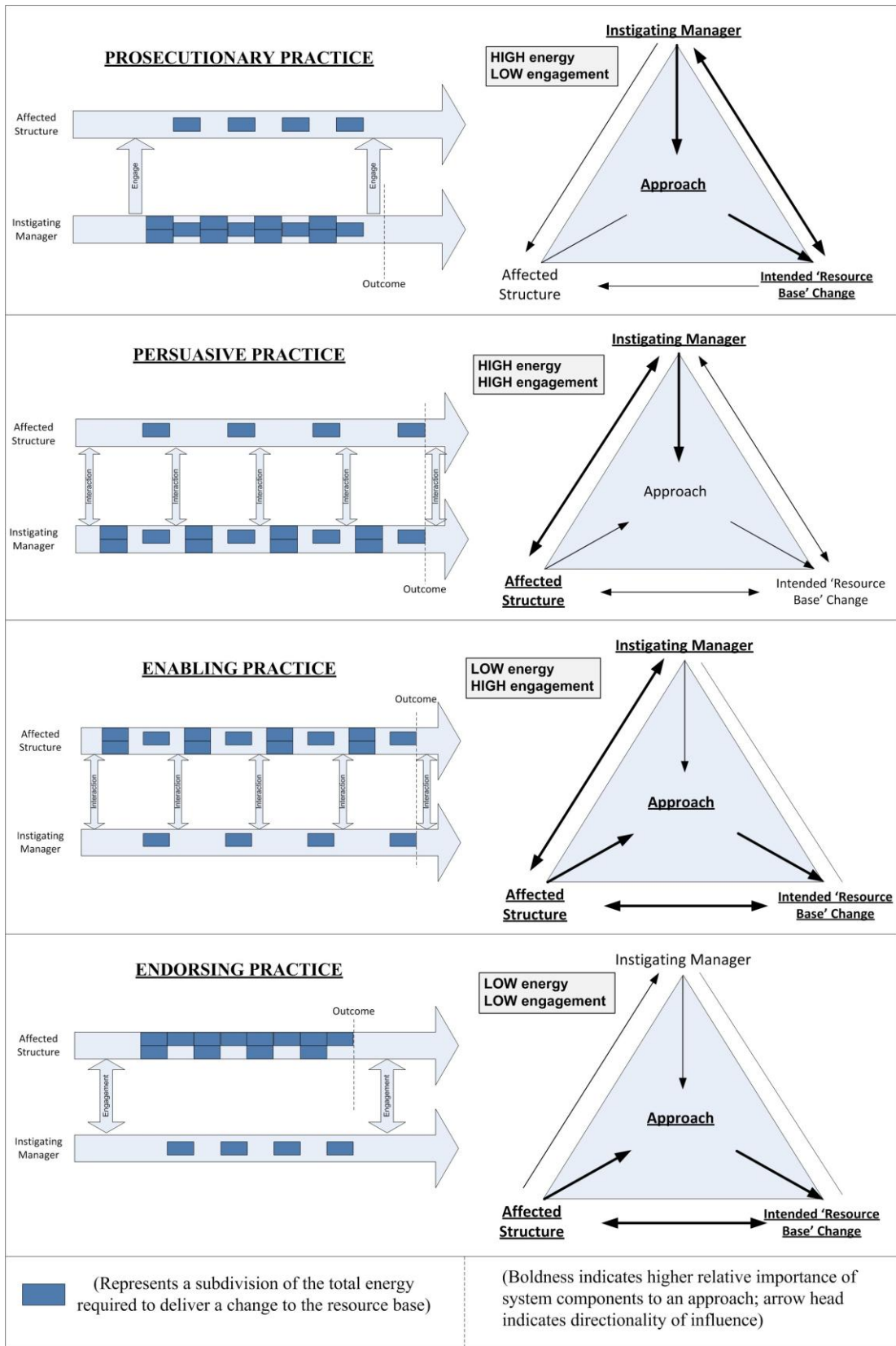


Diagram 6.13 – Overview of Deployment Practice Configurations

Understanding Situational Needs

The illustrative examples presented alongside the activity systems diagrams in the previous section suggest that deployment practice configurations varied according to circumstances in both of the case contexts. Based on the premise that the deployment configuration can be varied situationally by the instigating manager, the question still remains as to how a deployment approach should be selected. To address this gap, it is first necessary to develop an approach to characterising the deployment requirements of different contexts.

Based on the model of a dynamic managerial capabilities deployment event depicted in diagram 6.2, intended strategic change is enacted through the combined efforts of the instigating manager and the affected structure. However, the retroductive analysis and propositions developed in chapter 5 suggested that the affected structure's view may have an impact on the effort committed to the change event and the initial clarity of the outcome may require differing levels of managerial engagement to work out clarification as the change event proceeds.

For example, when an engaged structure is against a proposed change, the majority of the energy required for delivery may have to be supplied by the instigating manager; when a change is initiated with low clarity of intended outcome, frequent engagement with the instigating manager may be required to keep the change event on track. Culture change case examples such as AGS 3a, 6a, 6c and Solway 1d, 4a, 6c illustrate a situation where the engaged structure was against the change, the outcomes were unclear, and high levels of managerial time and energy were required to be invested to steer the changes through. In these examples, the combination of engaged structural view and clarity of outcome might be considered as the situational needs.

Combinations of these different characteristics are adopted as ways to describe the deployment situation. It is worth noting that whilst in the application of the conceptual framework, the 'FOR' and 'AGNOSTIC' categories were separated to

reflect the views experienced through engagement with the case organisations, retrospective analysis of the case data suggests that in actuality they represent very similar situational needs (i.e. both an ‘agnostic’ and a ‘for’ view don’t resist change and will contribute as directed). Therefore combinations of against/not against structural views and high/low initial clarity are considered. The case narrative and retroductive analysis of chapter 5 should be referred to for supporting examples.

AGAINST change and HIGH initial clarity - the engaged structure needs TOLD

Where a mooted change is not supported by the engaged structure but the initial clarity of outcome is high, managers may use the influence and power of their position to tell people what to do. As the expectations of the outcome are clear, individuals do not have to agree to or contribute to shaping the nature of the outcome and just have to do what is asked of them by the instigating manager. As a result of their position against the intended change, the engaged structure is unlikely to spontaneously or proactively devote energy towards it. However, when it is TOLD to do so, the engaged structure will make the minimal required contribution as instructed by the manager.

AGAINST change and LOW initial clarity - the engaged structure needs SOLD

Where an intended change is against the views of the engaged structure and the initial clarity of outcome is low, the ambiguity of the situation presents an opportunity for ongoing resistance. As the targeted outcome of the change event is not wholly clear, the instigating manager must engage with the organisation for resolution and in needing the engaged structures buy in, needs to adopt a collaborative approach to SELL change. Ultimately, the goal of the manager may not be to convert the engaged structure to a FOR view but rather to gain sufficient contribution to allow the intended outcome to be clarified and achieved.

NOT AGAINST change and LOW initial clarity - The engaged structure needs DIRECTED

In the situation where the engaged structure supports the intended change but the initial clarity of outcome is low, the instigating manager needs to engage with the

organisation on an ongoing basis to resolve the form of the outcome. However, as the engaged structure is not against the change, it may supply the energy/effort to make the change happen. Therefore, the ongoing clarification exercise means the engaged structure needs directing over a period of time.

NOT AGAINST change and HIGH initial clarity - The engaged structure needs ORIENTED

Where an intended change is not opposed by the engaged structure and the initial clarity of outcome is high, the engaged structure effectively needs an orienting signal from the instigating manager to commence deployment.

The situational needs characterised above are summarised in diagram 6.14

	High Initial Clarity of Outcome	Low Initial Clarity of outcome
AGAINST	Engaged structure needs TOLD	Engaged structure needs SOLD
FOR & AGNOSTIC	Engaged structure needs ORIENTED	Engaged structure needs DIRECTED

Diagram 6.14 – Situational Needs Characterisations

Situational Configurations

Against the situational needs depicted in diagram 6.14, the research findings and data analysis from chapter 5 can be drawn on to develop understanding of how successful were the deployment configurations in different contexts.

Diagram 6.15 shows combined data from the two case contexts. The columns in grey shows the number of change events where the deployment configuration was used in the context of the situational needs displayed in the leftmost column; the columns in

white with visual indicators show the related % of intended outcomes successfully achieved.

	ENDORSE		ENGAGE		PROSECUTE		PERSUADE	
	Number	% success	Number	% success	Number	% success	Number	% success
SOLD	26	0%	5	20%	6	0%	24	96%
TOLD	2	50%	2	50%	13	92%	9	78%
STEER	20	55%	21	90%	6	83%	11	100%
ORIENT	24	92%	14	86%	16	94%	6	100%

Diagram 6.15 – Practice Configurations vs. Situational Needs

Based on the empirical data and practice perspective as described above, table 6.15 arguably offers several inferences of consequence to the general aims of this study. Firstly, different activity configurations appear to have different **efficacy** in different situations. As can be seen from the visual indicators, the persuasive approach has a high level of effectiveness regardless of the situation, whereas the endorsing approach only delivers a high level of success when the situation requires orientation of the engaged structure.

Furthermore, viewed in terms of **efficiency**, it could be argued that in many of the events, an unnecessarily high level of managerial resource (in terms of energy, time or both) was deployed. For example, reading across the ‘ORIENT’ situational need row, 24 events used an endorsing approach to deliver the intended outcome with a high level of success. However, a further 36 events (in total across the other 3 configurations) adopted configurations with a higher level of energy and/or time to deliver the intended outcome to the same level of success. As such, it could be argued that managerial resource was wastefully used in these 36 cases in light of the situational needs.

In effect, diagram 6.15 suggests that indeed different situational needs may be matched to different deployment practice configurations against both efficiency and efficacy criteria.

Further Implications

As already discussed, this exposé of dynamic capabilities deployment has attempted to answer Regnér's (2008) call to empirically map activity configurations and these maps can now be further developed to address Pablo et al's (2007) concern that there is little understanding of 'how' managers can enable dynamic capabilities.

The activity systems diagrams and empirical analysis suggest that in the deployment of dynamic managerial capabilities, managers might influence the likelihood of success of achieving the intended outcomes by varying their levels of engagement and energy according to the circumstances of each event. However, they do so in the context of a limited amount of managerial resource and therefore are challenged to find the least resource intensive approach that the situation will allow in order to maximise their overall effectiveness. Based on the empirical data gathered in this study, the optimal balance of efficacy and efficiency in deployment practice suggested by the case data from this study is represented in diagram 6.16.

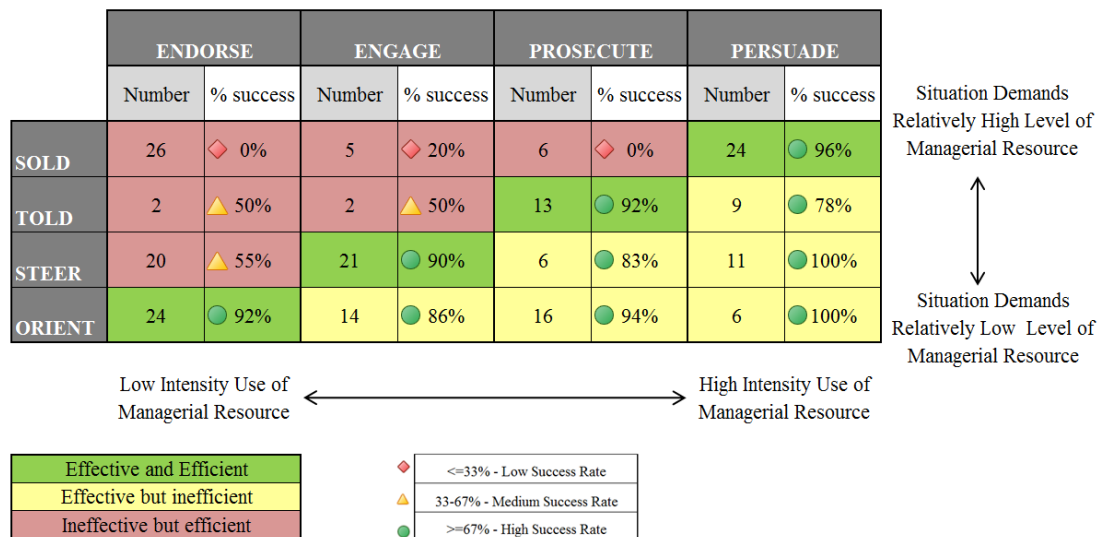


Diagram 6.16 – Efficacy & Efficiency of Deployment Practice by Situational Needs

One immediate implication of this diagram which can be inferred is that the low intensity deployment approaches are ineffective in highly demanding contexts. For example, diagram 6.15 indicates that of the 26 deployment events studied where an endorsing practice was used in a situation where the engaged structure needed ‘sold’, there were no examples captured of the intended outcome being achieved. Furthermore, diagram 6.16 suggests that deployment practice can be effective but inefficient – of the 205 events studied across the two case contexts, 61 were enacted using a level of resource which was likely unnecessarily high. Both these scenarios could have ramifications for a deploying manager or their host organisation. To frame these consequences, notions of the “fitness” of dynamic capabilities reviewed in chapter 2 are recapped.

According to Helfat et al (2007) and Teece (2007), technical fitness describes the efficiency of a dynamic capability in performing its purpose whilst evolutionary fitness describes how well a dynamic capability allows an organisation to meet its goals (its efficacy). It is argued that the different sections of diagram 6.16 represent different states of technical and evolutionary fitness of dynamic managerial capabilities.

Technical fitness is also described in terms of quality per unit cost – high technical fitness is associated with the minimum expenditure of energy to achieve the threshold level of performance. In diagram 6.16, the area marked in yellow does achieve the required outcome but expends more than the minimum required to do so and therefore is argued to have low technical fitness. Evolutionary fitness is determined by how well a dynamic capability delivers the intended change (which in turn is expected to contribute towards organisational goals). The area in diagram 6.16 marked in red, represents low evolutionary fitness where the approach is much less likely to deliver the required outcome (than alternative approaches).

The green areas marked in diagram 6.16 are argued to represent technically and evolutionary fit approaches to the deployment of dynamic managerial capabilities in

practice – where the threshold level of performance is achieved (evolutionary fitness) at the minimum level of managerial resource deployment cost (technical fitness).

Therefore, the analysis above implies that a situational approach to deployment practice is a vital consideration for an organisation concerned with maximising technical and evolutionary fitness of dynamic (managerial) capabilities. It is important to recognise that diagram 6.16 is tied to findings based on the 205 events analysed across the AGS and Solway contexts, raising the question of “would the same implications be derived from a different setting?” Furthermore, considerations other than fitness (such as managerial perceptions of risk) might influence or supersede the recommendations implicit to diagram 6.16.

Chapter Summary

In this chapter, a strategy as practice perspective was first identified as an appropriate lens through which to review and develop the findings of this thesis. Drawing on critical realist social theory, models describing deployment approaches of varying engagement and energy levels were proposed. These were subsequently developed into activity systems diagrams describing the relationship of the instigating manager, engaged structure and intended change to the resource base. These practice configurations were then mapped against situational needs based on the empirical findings.

Several further inferences were made from the case data and research findings through outcomes derived from applying the strategy as practice perspective. Aside from the models of practice developed, an argument was built to suggest dynamic managerial capabilities should be applied in a contingent manner according to the needs of the situation. Relatedly, it was argued that notions of efficiency and efficacy, representing technical and evolutionary fitness, may be attached to the practice configurations deployed in different situations.

The following discussion chapter aims to develop and shape the findings of the thesis so far into a contribution to knowledge.

Chapter 7 - Discussion

“Without theory, experience has no meaning. Without theory, one has no questions to ask. Hence without theory, there is no learning”

W.E. Deming, 1993

Chapter Summary

The aim of this chapter is to draw together the findings from literature, empirical investigation and analytical reflection into a discussion of potential implications. The chapter starts with a summary of the findings in the thesis thus far to introduce a theoretical model based on a revision of the conceptual framework in light of the findings and reflections of chapter 5 and 6.

This model is argued to represent a contribution to knowledge as a unique framework of deployment practice which is able to incorporate and explain extant literature on dynamic managerial capabilities but also broadens the current view. It is argued that this model might serve as a useful point of departure for integrating related research fields, interrogating the development of dynamic capabilities in practice or further building links between the resource based and dynamic capabilities literatures.

Practical implications are also inferred. The importance of a situational approach to deployment is emphasised. Means by which activity systems diagrams and deployment practice configurations could be put to use in an organisation are discussed. Furthermore, the value of a real options approach to developing intangible resources is argued.

The general approach of the thesis is critiqued. A case is made for the extension of the structured literature review method to include meta-data considerations. A mixed methods approach to investigating dynamic capabilities in practice is proposed as a means by which quantitative methods can be appropriately harnessed. The limitations of the study are described and a mid-range theoretical contribution is confirmed.

Introduction

Whetten (1989) suggests that the task of making a theoretical contribution can be framed by three simple questions – ‘what?’, ‘how?’ and ‘why?’ In this thesis, the main research question was refined to address the deployment of dynamic managerial capabilities in practice. Against this aim, the question of, ‘what factors are necessarily involved?’ was addressed by the development from literature of a conceptual framework in chapter 3 (diagram 3.4). Subsequently, a methodology to test the conceptual framework empirically was developed (chapter 4), and case data from two organisations – Architectural Glazing Systems and Solway Structural Steel was collected, analysed and compared (chapter 5). This activity resulted in a series of literally or analytically replicated propositions and bounded answers to the matter of ‘how are dynamic managerial capabilities deployed in practice?’ Finally, the question of ‘why did the findings of the first two questions emerge as they did?’ was explored through a strategy as practice lens (chapter 6).

Dynamic Managerial Capabilities

Dynamic managerial capabilities deployment success is influenced by the **initial clarity** of intended outcome, the level of **energy** invested by the manager, the level of **engagement** between the manager and the affected structure (internal or external) and the **views of the affected structure**. The approach adopted by the manager is described in terms of the mix of **routine and agency** in the managerial processes used in deployment – results suggest that a **balanced approach** (rather than agential biased or routine biased) will be most successful in most circumstances. Analysis of the empirical evidence also suggested that, at the managerial level, dynamic managerial capabilities are **dissipative** and **do not guarantee success** – 59 out of the 205 events examined failed to deliver their intended outcomes.

Organisational-level Dynamic Capabilities

Organisational level dynamic capabilities are **deployed over time**, grounded in **processes** and reliant on **managers** and **can be used to deliver change to the resource base reactively or proactively**. This analysis also suggests that at an intermediate level (meta-events comprising multiple managerial level events), dynamic capabilities as **meta-constructs** are **complex and inter-related**, with

sequential and **concurrent deployments** exerting **direct and indirect** influence on each other.

Practice Perspective

Development of the research findings through a practice lens further suggests that dynamic capabilities deployment activities are **situated**. **Deployment activity configurations** can be described in terms of the **interaction** between an **instigating manager**, an **affected structure** and the **intended resource base change**. Four principle configurations of practice are identified:-

Prosecutionary Practice	High Energy, Low Engagement	The manager drives through change with little cognisance of the views of the engaged structure
Persuasive Practice	High Energy, High Engagement	The manager drives change collaboratively, investing time in engaging with the affected structure
Enabling Practice	Low Energy, High Engagement	The manager directs the affected structure to use its energies to deliver an outcome
Endorsing Practice	Low Energy, Low Engagement	The manager signs off on change and largely leaves the engaged structure to deliver it under its own direction using its own energy.

Different situations have different needs, which can be defined in terms of the engaged **structure's view** and the **clarity of the intended outcome**.

The empirical data suggests that deployment activity configurations can be matched to different situational requirements, as depicted in diagram 6.16 in order to optimise **efficiency and efficacy**, which in turn are argued to represent the **technical and evolutionary fitness** of dynamic managerial capabilities.

Discussion of Potential Implications for Dynamic Capabilities Theorising

In light of the findings outlined above, what might be the implications for the dynamic capabilities perspective? This section discusses several potential implications.

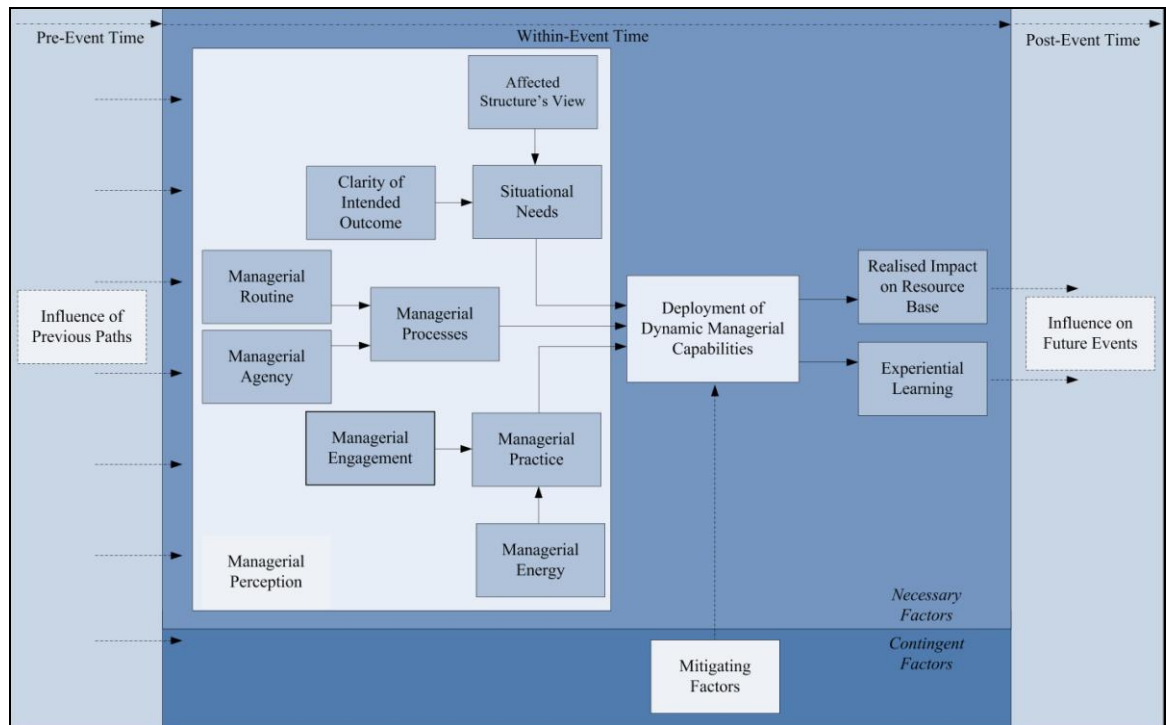


Diagram 7.1 - Theoretical Model of Dynamic Managerial Capabilities Deployment

Description of Theoretical Model

Firstly, the original conceptual model is revised based on the research findings and the strategy as practice analysis. A proposed theoretical model of dynamic managerial capabilities deployment is depicted in diagram 7.1

The proposed model can be described in terms of the findings of the thesis. Within-event and extra-event (pre and post) components are considered separately. The first main characteristic of the within-event elements is that managerial perception is proposed as an overarching factor driving deployment. Consistent with the Helfatian definitions, managers perceive the need to make a particular change to the resource base and thus instigate a deployment event. In other words, deployment is driven by a managerial perception of the need to change and is therefore triggered by a

combination of managerial awareness, cognitive abilities and mental models. In addition, managerial perception of circumstantial requirements will influence the nature of the managerial processes deployed (in terms of the mix of routine and agency used), the approach to the practice of deployment (in terms of energy and engagement levels) and their understanding of the situational needs (relating to the clarity of change and the perspective of the affected structure).

The actual deployment of dynamic managerial capabilities is represented as a confluence of situational needs, managerial processes and managerial practices – the particular component combinations of which can vary on a deployment by deployment basis. The interaction of these necessary factors may be offset by the effects of mitigating factors. Such mitigating factors can occur on a contingent basis and can have positive or negative effects. As a result of the deployment, a ‘realised’ version of the intended impact on the resource base emerges - the exact form of this change will depend on the confluence of necessary and contingent circumstances. Also, being involved in the deployment event will result in experiential learning for the deploying manager although this may be minimal and/or flawed, depending again on circumstances.

The extra-event components suggest that the deployment factors are influenced by history and prior events, and also once an event occurs, it will shape in some form future deployments. The multiple arrows feeding into managerial perception and the within event factors are intended to represent the multiple potential historical paths which may provide the context for the current deployment (the number of arrows is arbitrary). These can originate from a wide range of sources (such as operational processes), not just previous deployments of dynamic managerial capabilities. The model is also intended to represent potential historical influences on contingent factors. Post deployment, the realised change to the resource base or the experiential learning may act as an influence on future deployment events.

Comparison of Theoretical Model to Dynamic Managerial Capabilities Literature

It is argued that this model may represent a unique contribution to dynamic capabilities theorising as, at the time of writing, no deployment practice models

prepared at a managerial level are known. Indeed, related commentary and inferences may also provide unique contributions as only 6 of the 183 papers reviewed in the structured literature review (plus aspects of the book “Dynamic Capabilities - Understanding Strategic Change in Organisations” by Helfat et al, 2007) addressed dynamic managerial capabilities specifically.

To explore this claim, the question is first asked “How does the theoretical rationale underpinning the model depicted in 7.1 agree and differ from the current available views of dynamic managerial capabilities from literature?” From a theoretical perspective, the definition of dynamic managerial capabilities offered by Helfat et al (2007) has already been adopted. These authors further suggest that “dynamic managerial capabilities arise from prior learning and experience” (p5). This view is represented in the theoretical model in diagram 7.1 where the effects of previous paths influence deployment events and experiential learning from current events will influence future deployments. Furthermore, Helfat et al (2007, p117) suggest that dynamic managerial capabilities “can have low rather than high evolutionary fitness if employed in inappropriate settings.”. This view is also incorporated in the theoretical model as the “realised outcome achieved” may differ from the intended outcome, and could potentially be damaging to the organisation (i.e. have low evolutionary fitness). Helfat et al (2007) further refer to dynamic managerial capabilities as providing “asset orchestration” – heavily implying the need to engage with the resource base during deployment as captured in the model. Helfat et al (2007), through a case example of the Rubbermaid corporation, also emphasise the importance of managerial perception, agency and routine in enabling organisational level dynamic capabilities (although no hierarchical relationship between managerial and organisational levels is explicated).

Adner and Helfat’s (2003) study of the US oil industry, based on archival analysis of secondary data over twenty years, suggests that dynamic managerial capabilities are strongly influenced by the skills and experience (human capital), social capital and cognitive frames of the instigating managers. Adner and Helfat’s (2003) paper makes a content contribution (in suggesting what personal managerial factors might be

influential) and the methodology they applied lacks the granularity of data to be able to comment on practice and situational factors of deployment. Eggers and Kaplan (2009) and Sirmon and Hitt (2009) also propose similar content contributions emphasising managerial cognition and agency/perception respectively based on quantitative analysis of secondary data. In effect, these quantitatively deduced contributions imply personal managerial characteristics rather than deployment practices which may constitute dynamic managerial capabilities.

Qualitative cross case contributions are offered by Bruni and Verona (2009) and Taylor and Helfat (2009). Bruni and Verona (2009) focus on the pharmaceutical industry and examine dynamic marketing capabilities, which they argue are a subset of dynamic managerial capabilities. Their work is exploratory and whilst hinting at the critical role of managerial cognition and responsiveness to circumstances, calls for further development of dynamic managerial capabilities. Taylor and Helfat (2009) conduct an historical case comparison of IBM and NCR primarily based on secondary data and focusing on major technology transitions. They emphasise the role of managers in providing continuity to the operation whilst guiding through major change, effectively endorsing the view that dynamic managerial capabilities are the foundation of organisational dynamic capabilities. However, fine detail is lacking and the deployment of dynamic capabilities in practice is not addressed.

The work of Salvato (2009) is the empirical paper covered in the structured literature review with the closest form and focus to this thesis. Salvato's (2009) paper describes his engagement with Alessi, an Italian bespoke furniture manufacturer, over a number of years. A broad range of rich case data is collected through mixed case study methods, including participant observation, and is analysed by a mixture of quasi-statistics (albeit different style to this thesis) and interpretation of qualitative data. His findings suggest that micro-level interpretation and action by individual managers at Alessi drove day-to-day adaptation of the organisation, consistent with the practice views incorporated in the theoretical model in diagram 7.1. He found that managers varied their roles and whilst they made certain types of change themselves, they regularly collaborated with the organisation to deliver others. This

aligns with the need to engage with the organisation and also to devote energy to dynamic managerial capabilities. He notes that the skills to do so have to be maintained through practice on a regular basis and finds that there is a routine component to dynamic managerial capabilities which can aid effective deployment ongoing. This view is captured in the theoretical model through the learning, previous paths and routine elements. His reflective analysis also suggests that managerial activities lead to organisational level effects over time – a view reflected in the general findings of this thesis.

Theoretical Extensions of Current Literature Views

The views expressed in the limited body of literature which currently exists on dynamic managerial capabilities either align with or are accommodated by the theoretical model depicted in diagram 7.1. In particular, the model fits very closely with the practice oriented case findings of Salvato (2009). However, the theoretical model also offers a number of extensions which arguably form a contribution to theory.

Firstly, dynamic managerial capabilities are shown to be deployed by a contingent blend of managerial practice approaches and managerial processes in a situational context. This model of management deployment practice thus broadens the suggested components interacting through deployment beyond the scope of managerial characteristics as suggested by quantitative approaches.

Secondly, the model recognises the influence of contingent factors as potential enhancers or inhibitors of intended deployment outcomes. This is based on a critical realist ontology in which the differentiated nature of reality means that dynamic managerial capabilities effects may be influenced by the presence and effects of other real world objects (internal and external to the organisation). These mitigating effects are contingent and whilst they can happen (and often do), they do not necessarily happen with every deployment. This separation of necessary and contingent components represents an ontological distinction between this theoretical model and much of extant theory.

Thirdly, experiential learning is recognised as a necessary outcome of dynamic managerial capabilities deployment regardless of success in achieving the intended change to the resource base. Extant dynamic managerial capabilities literature identifies the potential to yield some intended form of change to the resource base; diagram 7.1 extends this view for deployment in practice based on the argument that the very act of instigating and being involved (to whatever degree) in deployment will necessarily yield some form of (albeit potentially flawed) experiential learning.

Fourth, the role of managerial practice in deployment of dynamic managerial capabilities is defined in terms of managerial energy and level of engagement with the affected structure. Organisational level dynamic capabilities literature suggests that available managerial resource (Penrose, 1959; Mahoney, 1995) is a key constraint on an organisation's ability to change – the proposed theoretical model extends this view to a micro-level practice perspective, implying that managerial energy levels will impact individual resource based changes. This model also identifies the level of engagement with the organisation as a key factor in the deployment of dynamic managerial capabilities. As a result, the theoretical model in 7.1 supports the views of activity systems configurations developed in chapter 6.

Implications

What are the implications of the proposed theoretical model and the related extensions to theory?

Firstly, this model may provide an integrating framework for developing the dynamic capabilities perspective at a managerial level. Each element of the model may be linked to related bodies of literature directly (e.g. routines) or indirectly (e.g. organisation theory on the impact of organisational inertia/culture linked to the 'affected structure's view' element). As such, the model might provide a means to channel understanding and further research into specific aspects of how each of the elements impacts deployment practice.

Secondly, as this model is grounded in critical realist philosophy, its primary aim is explanation rather than prediction (Ackroyd and Fleetwood, 2000). It displays a

number of factors which are argued to necessarily interact during deployment, thus providing a means to explain how dynamic managerial capabilities are deployed in practice. However, it does not imply that outcomes will be guaranteed or predictable - the inclusion of a mitigating factors element, which may impact deployment, and the overall influence of subjective managerial perception should emphasise the lack of certainty with which and in which dynamic managerial capabilities are used. As a result, a key implication of this model might be to challenge the validity of extant dynamic capabilities research grounded in quantitative approaches seeking to establish formal relationships between environmental circumstances and dynamic capabilities deployment (e.g. Pavlou and El Sawy(2006), Wu (2006, 2007, 2010), Moliterno and Wiersema (2007), Peteraf and Reed(2007) and Fang and Zhou (2009). This point is developed in more detail below in the methodological discussion element of this chapter.

Thirdly, the clarification of experiential learning as a necessary outcome of dynamic managerial capabilities provides a point of departure for the investigation of how dynamic managerial capabilities development may be investigated over time. This thesis has been bounded by a focus on deployment but authors such as Zollo and Winter (2002)and Easterby-Smith and Prieto (2008) call for greater understanding of how dynamic (managerial) capabilities develop in practice. The theoretical model in 7.1 suggests that experiential learning is generated in each deployment but is vague about how different deployments interact. An implication of this model is that experiential learning is available to be developed or channelled between deployment events and how this is done could provide a useful focus for future studies.

Finally, the theoretical model in diagram 7.1 is argued to provide a means to connect dynamic managerial capabilities deployment practice to its resource based view origins. The mechanisms of the theoretical model are grounded in the logic of opportunity, representing how managers can perceive a need to change and act to effect such a change. However, in doing so, managerial resource characteristics and abilities (as suggested by Adner and Helfat (2003)) are leveraged, a logic which is reflective of a resource based perspective. If some or all of these managerial

attributes are stable over time, and superior (operating unmitigated) than those of competitors in effecting change, they may conform to the VRIN criteria identified by Barney (1991) as being at the root of a resource's potential competitive advantage. The same argument could also be built for organisational culture and linked into the model through the "affected structure's views" element.

In effect, this model may provide a point of departure for addressing the apparent duality of a change oriented dynamic capabilities perspective and the resource based view grounded in stability and leverage. Further exploring this potential connection through a managerial practice conduit might represent a step towards better defining the dynamic resource based view called for by authors such as Verona and Ravasi (2003) and Helfat and Peteraf (2003).

Organisational Dynamic Capabilities

In addition to revising the research question to examine a managerial level of practice, a secondary aim was retained of exploring further how dynamic capabilities are deployed at an organisational level. This section reviews the findings of the thesis outlined above in light of the original conceptual map to identify areas of agreement or conflict.

Confirmatory Findings

Dynamic capabilities are **deployed over time**. Both case contexts indicated that dynamic capabilities are deployed, in practice, over time, and may be considered as **processes**. The intent behind the deployment of dynamic capabilities, in terms of targeted organisational impact, was also shown to vary. In AGS, the business systems upgrade was a **proactive** measure undertaken to enable future growth potential without impacting profitability; in Solway, the 'adaption for survival' management of the resource base was clearly a **reactive** response to challenging environmental circumstances. Dynamic capabilities were also shown, for example in the continuous improvement theme in AGS, to be able to drive greater **exploitation** of the existing resource base. Equally, as in the market development theme in Solway, dynamic capabilities were directed towards the **exploration** of new resource base requirements and organisational opportunities.

By adopting Helfatian definitions, the role of the **manager** in organisational dynamic capabilities was strongly emphasised in this study. Accordingly, it would be analytic reasoning to claim that the outputs derived from data analysis supported the centrality of management to organisational dynamic capabilities. However, the raw case data and experiential learning of the researcher suggested that managers are vital to purposeful, strategic modification of the resource base. More generally, the findings of this thesis are consistent with the view that dynamic capabilities, at an organisational level, might be thought of as being composed of ‘lower-level’ capabilities, and as such are **meta-constructs** rooted in the potential of bundles of resources. The nature of the bundles drawn in to organisational dynamic capabilities was suggested to be **complex** and also, given the tacit nature of some component resources, **opaque and ambiguous**. The outcomes achievable by different deployments of dynamic capabilities were further shown to be **inter-related**. Sequential deployments were shown to be linked **directly** through resource base outcomes and **indirectly** through organisational learning.

Contradictory Findings

It was highlighted in chapter 2 that some authors believe dynamic capabilities to be fragile and vulnerable to environmental change. The findings of this thesis disagree with this perspective.

The two organisational contexts examined were in an industry which, over the period of empirical data collection, experienced a market demand contraction of c.60%. Despite this occurrence, the organisations were still able to purposefully execute change to the resource base at both a managerial and organisational level.

Why was this the case? The theoretical model in diagram 7.1 emphasises the overarching influence of managerial perception on deployments of dynamic managerial capabilities and, *ergo*, organisational level capabilities. The environmental shocks experienced in the case context appeared to focus the management team and build a shared perception in both organisations as to austerity

changes which had to be made to the resource base. In effect, the options were very limited for both organisations and arguably, the environmental shift created a higher than normal level of certainty as there was little disagreement about (a) the need to change and (b) what had to change.

However, the effectiveness of dynamic capabilities did appear to be more vulnerable over matters where multiple paths were available to the organisation and there was a high level of uncertainty. Case examples such as putting in place a website (AGS – case 4b) or gaining certification once preparation is complete (Solway – case 4a) suggest that a high level of uncertainty (about the need to change or the outcome to be achieved) contributed to apparently straightforward modifications to the resource base failing.

In effect, it appears that, as argued by Eisenhardt and Martin, (2000), Winter, (2003), Aragon-Correa and Sharma, (2003) and Pandza and Thorpe (2009), that uncertainty has a far greater impact on dynamic capabilities than environmental shifts. On the basis of a Helfatian definition, this makes sense. If dynamic capabilities are the capacity to make purposeful amendments to the resource base, uncertainty will impact the clarity of purpose. Environmental shifts or discontinuous changes may have an impact on the effectiveness of dynamic capabilities when they create uncertainty, but as highlighted above in the Solway response to recession, this need not always be the case.

Theoretical Implications

In light of the previous review of organisational dynamic capabilities versus the research findings, this section considers theoretical implications.

Supportive of an open systems model of the firm. The findings of this thesis suggest that an open systems model of the firm (such as that proposed by Sanchez and Heene (1997) – diagram 7.2 below) is an appropriate framework by which to develop further understanding of organisational level dynamic capabilities. Organisational dynamic capabilities were shown to be complex, opaque and

ambiguous but interrelated and emergent from resource bundles (including interaction with internal and external resources). It is argued that organisational dynamic capabilities are grounded in a blend of several elements of this model – drawing on management processes, intangible assets, tangible assets and being underpinned by strategic logic in determining intent.

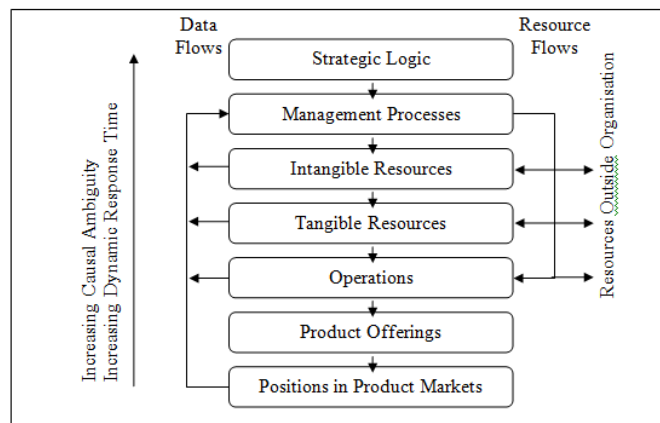


Diagram 7.2 – Open Systems Architecture (Sanchez and Heene, 1997)

From a critical realist perspective, organisational dynamic capabilities are subject to a broad range of mitigating factors, and being grounded in the action of managers (who are in turn fallible, changeable humans), they are argued to be constantly evolving because of inherent experiential learning effects. The findings of the thesis suggest that there are myriad further factors which can influence and impact organisational level dynamic capabilities.

This has implications for positivist research grounded in variance theory approaches. Firstly, the simplifying assumptions underpinning variance theory which are intended to simulate ‘closed system’ conditions are suggested to be “highly restrictive and unrealistic” (Van De Ven, 1992, p170). In reality, deployment approaches are situational, ambiguous, complex and opaque – suggesting that proxies for organisational effects and activities have a high potential to generate misleading findings (McKelvie and Davidsson, 2009). Secondly, expectations may be falsely set as to the degree of specificity with which we might know organisational dynamic capabilities- the findings of this thesis imply that nomothetic approaches are highly limited in their capacity to research open systems over time.

Instead, idiographic approaches to developing explanatory theory should be developed.

This is not to suggest that useful managerial tools or prescriptive approaches cannot be developed (as will be discussed below). What is inferred is that such outputs need to be presented as abstract aids to developing situational understanding rather than definitive rules to be stringently followed.

Dynamic capabilities are capable of being durable and situational. The argument that dynamic capabilities have a patterned and non-patterned component is supported by the findings of this thesis. In line with the views of Ambrosini and Bowman (2009), dynamic capabilities may be considered to have an ostensive and a performative component. Furthermore, the findings suggest that managerial perceptions will drive a situational mix of routine and agency at a managerial and therefore organisational level, defining the realisation of capabilities through processes on a case by case basis.

The implications for theory are that if it is accepted that dynamic capabilities have a durable, learned and repeatable component, then literature on routines, patterned behaviour and inertia can be used to understand how dynamic capabilities deployments may be made more efficient over time (e.g. their technical fitness may be improved). Equally, accepting the presence of an agential, unpatterned component suggests that literature from topics such as psychology, sociology and organisational behaviour may be drawn on to explain how dynamic capabilities are deployed effectively over time (e.g. their evolutionary fitness may be improved).

The feasibility of dynamic capabilities ‘best practice’ is challenged

Eisenhardt and Martin (2000) propose that dynamic capabilities can have best practice – they suggest that in the same manner that there is a best way to ski a mogul field, so too is there a best way to deploy dynamic capabilities. The findings of this thesis suggest that such a model of best practice will only exist at a high level of abstraction and that in fact, the notion of best practice as commonly interpreted is

misleading. To suggest that there is a right way to deploy dynamic capabilities effectively ‘dehistorices’¹⁵ situational requirements and ignores matters of internal and external context. Should a small family business producing bespoke, high value goods attempt to intentionally change their resource base in the same way that Toyota does so? The findings of this thesis align with the views of Benner (2009) who suggests that unless dynamic capabilities are fostered selectively rather than in line with best practice, an organisation may put its survival in jeopardy.

It is therefore suggested that the concept of characterising dynamic capabilities ‘best practice’ in alignment with all encompassing change philosophies such as TQM and Six Sigma is flawed. Whilst useful learning may be generated through studying alternative approaches, application must be considered and selective - ‘best practice’ will be to respond situationally and shape knowledge into a form which is useful for each individual organisation.

Implications for theory are that explanation building should be the focus of research activities. The dynamic internal and external environments facing organisations is unlikely to be addressed by copying the approach of a different organisation, even in the same industry. Instead, understanding how to make strategic change more effectively within an organisation offers greater potential for delivering valuable advice to managers.

Level of analysis is critical. When considered as an abstract concept, it appears that organisational dynamic capabilities represent a duality of stability and change. However, by understanding them hierarchically and in greater detail, the mechanisms by which such a duality might be managed can be revealed. In the same way that the properties of water are differentiated from the properties of oxygen and hydrogen, so are the properties of organisational dynamic capabilities quite distinct from dynamic managerial capabilities.

¹⁵ In the same way that the synchronic theoretical model in chapter 4 considered each event as stand alone.

When examined at an appropriately low level of detail, it is possible to build understanding of the meta-construct by developing better understanding of the component elements. E.g. that water is a polarised liquid at room temperature can be explained in terms of the differentiated properties of the non-polarised, gaseous oxygen and hydrogen molecules when investigated at a sub-atomic level. Equally, by better understanding how dynamic managerial capabilities might be deployed, so can theory be developed about how organisational dynamic capabilities might have particular capacities.

Failure to recognise the stratified nature of the social world can lead to theorising in dynamic capabilities (and indeed, in general) which cannot explain organisational effects. Where reality is collapsed into a single, ontological level, social mechanisms such as dynamic capabilities are reified, considering them as if they are concrete, independent structures rather than the complex social product of individual and collective practice (Bhaskar, 1975).

Such an approach conflates mechanisms operating at different levels of reality and related efforts at theorising are likely to lack explanatory depth. For example, consider a common question such as “how can organisational dynamic capabilities balance exploration and exploitation?” (Benner and Tushman, 2003; O’Reilly and Tushman, 2008; Anand et al, 2009). Addressing this question at an organisational level will be unlikely to explain how two apparently contradictory demands can be satisfied by the organisational entity and a duality is inevitably proposed. However, through examination of a managerial level of activities and daily interactions within an organisation, mechanisms situationally enacting different kinds of change or maintaining stability can be uncovered and understood. Analysis and reflection of these micro-level findings can then explain how organisational dynamic capabilities can meet apparently conflicting demands.

The implication for dynamic capabilities theorising is that if progress is to be made in developing understanding of how dynamic capabilities are deployed, research activities have to pay closer attention to managers and what they do in different

situations. Ambrosini et al's(2009) stratified model of dynamic capabilities deployment could be developed further from a practice perspective to advance this work.

Practice Related Managerial Implications

A key motivation for the selection of this topic was noted as the author's experience as a practicing manager and the regular challenge of attempting to make purposeful strategic change in the face of uncertainty. Priem and Butler (2001) lay down a challenge for 'internal' strategy perspectives to develop meaningful management tools in the form of actionable prescriptions for practitioners, particularly relating to how to manage tacit resources. Ambrosini and Bowman (2009) suggest that a basis for managerial prescriptions might be developed by considering the detail of dynamic capabilities through a strategy as practice lens. Chapter 6 of this thesis examined the research findings from a strategy as practice perspective and in doing so generated the models of deployment practice illustrated in diagram 6.13.

The aim of this section is to discuss the implications of these activity models for practising managers in attempting to address the question "As a manager, what should I do to effect appropriate change?"

Direct Answer – Adopt a Situational Approach

The findings of this thesis imply that, for managers, a situational approach to dynamic capabilities deployment is essential. In effect, managers should make decisions about how best to address the particular needs of the change context each and every time deployment is attempted.

The review from a strategy as practice perspective also suggests that two key questions might help determine an appropriate response:-

- What is the view of the engaged structure?**
- How clear is the intended outcome?**

Depending on the responses to these questions in combination, a manager might select an approach to deployment which may optimise the technical and evolutionary fitness as described below in table 7.1.

	High Initial Clarity of Outcome	Low Initial Clarity of outcome
Structural view AGAINST Intended outcome	Engaged structure needs TOLD – PROSECUTIONARY deployment practice should be used	Engaged structure needs SOLD – PERSUASIVE deployment practice should be used
Structural view FOR or AGNOSTIC to intended outcome	Engaged structure needs ORIENTED – ENDORSING deployment practice should be used	Engaged structure needs STEERED – ENGAGING deployment practice should be used

Table 7.1 – Deployment Approach According to Situational Need

To emphasise the importance of a situational approach, the concepts of technical and evolutionary fitness could be shared along with the activity system diagrams, practice configurations and structural context explanations.

Depending on the organisation different views of risk might be impact the perceived importance of the concepts of evolutionary and technical fitness. All strategic changes might not be considered equal and where a change is of higher perceived importance, managers may sacrifice a degree of technical fitness for a higher level of evolutionary fitness of deployment approach. In other words, depending on the criticality of a resource base change to the organisation, lower efficiency may be accepted in exchange for a more efficacious approach to offer an improved likelihood of desired outcome being achieved. Equally, for changes of lower perceived importance, managers may use lower intensity approaches and accept the risk that the change may fail.

Consideration of the Constraint of Managerial Resource

The results presented in chapter 5 suggest that the resource of management is a key constraint in the deployment of organisational level dynamic capabilities. Analysis of

the data from both AGS and Solway suggested that the level of managerial energy devoted to a change event has to be matched to the situational needs of the change. The analysis also suggests that such managerial resource is in finite supply and can be dissipated by organisational issues aside from dynamic capabilities. If dynamic capabilities describe the theoretical potential to purposefully adjust the resource base, the findings of this thesis imply that the theoretical managerial resource requirement might be assessed in terms of actual available **amplitude** when deploying dynamic managerial capabilities. In other words, a key question for managers at deployment of dynamic managerial capabilities might be “Do I have sufficient energy/attention to meet the situational needs of this change in light of other operational and dynamic requirements?”

On this basis, it is suggested that managers seeking to undertake strategic, purposeful adjustment of the resource base should assess their current portfolio of activities and likely available resource prior to initiation. Projects could be triaged in terms of strategic priority and cost (financial, time and effort) and initiated when sufficient resource become available. As organisational circumstances change, such a measure of amplitude could be assessed in order to better represent the level of resource base change which might realistically be achieved.

For managers, the notion of actual available amplitude could imply a regular sampling of demands and availability of resources. It could mean the need to abandon change events quickly and without emotion as mitigating factors come to light or are better understood. Each deployment event needs to be regularly reviewed for relevance and importance.

The activity systems models developed in chapter 6 could form the basis of a related managerial resource planning approach. Activity configurations could be used to estimate the demands on managerial resource on an event by event basis and, if similar estimates are prepared for operational and administrative duties, a managerial loading factor could be calculated. As projects progress, resource demands could be updated in light of emergent requirements/ operational demands and changes in

approach. This management information could then enable more informed decision making with a view to keeping dynamic capability deployment success rates high.

This approach could equally apply to organisational level dynamic capabilities. If the demands of an organisational level change are first understood in terms of the requirements at a managerial level and then modelled as a sequence of practice configurations, managerial loading factors across projects could be understood.

In previous consultancy-based practitioner roles, the author frequently observed managers committing to strategic projects on the basis that, in abstract, they had the ability to enact a particular type of change and they perceived business benefits in successfully doing so. A further common observation was the failure of such strategic change projects as managers lacked the time and attention to follow through on the particular needs of change projects. In such circumstances, the availability of a tool to illustrate their resource commitments prior to initiating a change event may have resulted in fewer projects being undertaken but with a greater rate of success.

This view is anecdotal and as such can easily be called into question. However, the empirical evidence and analysis reviewed in this thesis appear to confirm the idea that operationalising dynamic amplitude might offer significant benefits to practising managers.

Reframing Efficiency Views

Where efficiency is represented as output / input, it could be argued that change before it is absolutely required is inefficient, as inputs are committed in advance of the ability to yield useful outputs.

The findings of this thesis challenge such a view when the aim is to build intangible resources in an organisation. Both case contexts demonstrated that certain types of change – intangible change in particular – can take a long time to enact, and that the timescale required doing so is very hard to predict. In practice when making intangible change, the case narrative and maps of influence in this thesis suggest that

it is necessary to accept “inefficiency” - intentional changes to strategic intangible resources are accompanied by an inherent need to practise, get things wrong and gain experiential learning in order to deliver intended effects incrementally.

In many ways, such a suggestion is a restatement of the notion of time compression diseconomy (Dierickx and Cool, 1989), the idea that certain resources have to be built over time in a manner which, if accelerated, will be unlikely to yield the same level of results (e.g. crash R&D programmes).

Based on the specific findings of this thesis, the implication for managers is that a proportion of dynamic managerial capabilities deployments might usefully be diverted towards a ‘real options’ approach to the development of intangible resources. As described in chapter 2, a real options approach advocates a continual minimal investment of managerial resource in exploratory activity. This approach hedges against time compression diseconomies of future resource requirements whilst minimising the cost of managerial time and attention. A number of options can be maintained through a low grade deployment of managerial resource with the potential to ramp up activity if a need arises.

For example, managerial resource invested in developing a continuous improvement approach in an organisation competing in munificent market conditions may seem inefficient as the resource could otherwise be directed to exploiting the favourable trading conditions, returning immediate profit. However, should market conditions become significantly less favourable the organisation may have accumulated a valuable intangible resource in the form of a lean culture which they can draw on to reduce costs. Such a resource cannot be developed rapidly, no matter how much managerial resource is thrown at it.

According to Grant (2008), Jack Welch, former CEO of General Electric advised, “change when you don’t need to”. The findings of this thesis suggest that managers should heed this warning through a real options approach when seeking to develop intangible resources.

Contribution to Literature Review Methodology

Does the use of meta-data enhance the scope of a literature review?

This section argues that the use of meta-data can add an extra depth to the structured literature review and as such may extend the insights offered by the approach.

This thesis deployed meta-data in only a limited way (as a detailed analysis of the field of dynamic capabilities was not the explicit aim of this study). However, the information displayed in chapter 2 still provides some insight into how meta-data might arguably enhance a structured literature review.

Firstly, as demonstrated in table 2.2, meta-data can make available to the reader a detailed expose of the sources which have been tapped for the actual review. This might act as a form of quality control based on the ratings of publications as suggested by ranking systems such as ABS and SSCI. This does not mean that a reviewer drawing source papers mainly from low ranking journals will produce a review that is in itself of low quality. However, meta-data about journal sources might make the reader aware that the concepts returned by the reviewer through the structured process are not of “high impact” or wide readership – a potentially important consideration when critically evaluating a literature review.

Furthermore, details such as those displayed in table 2.2 can allow the reader to gauge the level of interest within the academy about the topic which is the focus of the review. Based on the structured literature review boundaries of this thesis, the meta-data in table 2.2 offers the foundation for further inquiry. For example, whilst there is a strong interest in the topic in academic journals such as the Strategic Management Journal and the British Journal of Management, there appears to be a dearth of contributions in the top ranking management journals with a strong practitioner focus (e.g. Harvard Business Review, Sloan Management Review). This could mean that the field is ripe for such a contribution or it could also mean that the topic is not conducive to practice. Regardless of the underlying reasons, the meta-data can inform the reader and prompt further investigation.

Secondly, diagram 2.1 shows meta-data being used to illustrate the development of the field based on the literature review findings. As has already been argued, such data can allow commonly held beliefs to be confirmed or disconfirmed, such as the erroneous view that there is a lack of empirically grounded publications on dynamic capabilities. As a consequence, such meta-data can allow the researcher to identify current trajectories and can be used as a basis for claims about the state of literature in a field. Such claims might directly identify where a contribution to literature can be made or might be used as contextual data within which a research agenda can be assessed (such as the example discussed in chapter 2 about the increased importance of qualitative research in light of current trends towards quantitative methods).

Thirdly, diagram 2.2 offers data which highlights apparent cultural influences on the approach to researching dynamic capabilities. In general, this type of data might be useful to a researcher seeking to make sense of conflicting views in a field or even deciding how to make a contribution. Montgomery (1995)'s view on orthodoxy illuminate this point. She observes that orthodoxy in research is a form of routine that creates efficient exchange of ideas through a common language and perspective but also represents a way of thinking of which it is difficult to break out. Montgomery notes (1995, p251)

"It is tempting to believe that one's outlook and behaviour are unbiased, that one selects topics, seeks information and orders the world without prejudice. To discover instead that there are patterns and proclivities in one's actions is once again to learn that free will is constrained by experience and conditioning. The lens through which one looks, and the direction in which that lens is pointed fundamentally impacts what one sees".

As such, it is argued that the meta-data in diagram 2.2 might provide insights and fodder for a researcher to critically reflect on their approach to a problem or situation. In diagram 2.2, there appear to be strong regional preferences for different types of contribution. This raises a question about the selection of methods – are approaches chosen, as Easterby-Smith et al (2002) recommend, for appropriateness to the object of research or are they selected based on institutional orthodoxy as

implied by Montgomery (1995)? Regardless of the answer, the meta-data is argued to usefully challenge the researcher to evaluate their motivations.

As mentioned above, this thesis uses meta-data in only a limited way. Further details about contributing authors, journals, academic institutions, countries etc were collected during the structured literature review and, with a different research focus, offer the potential for further relevant insights.

In summary, this thesis demonstrates how a structured literature review might incorporate a higher level perspective on a topic through the analysis of meta-data about contributions.

Supplementary Implication – Methodology

In Chapter 2, the question was raised about the appropriateness of quantitative methods for researching dynamic capabilities. This section discusses this matter in light of arguments arising in the subsequent chapters.

The review of literature in chapter 2 highlighted the complex, tacit and uncertain nature of dynamic capabilities and the conceptual framework developed in chapter 3 revealed a broad range of contingent factors which might impact the effects which dynamic capabilities are able to achieve. The research findings and review from a strategy as practice perspective further suggested that dynamic capabilities can be misapplied and fail, that approaches can vary in appropriateness and ultimately dynamic capabilities are situated and should be deployed in a contingent manner. On this basis, discussions earlier in this chapter argued that the assumptions required in quantitative approaches to simulate a ‘closed’ organisational system rendered them inappropriate for studies of dynamic capabilities over time.

This line of argument concurs with Sayer’s (2000) suggestion that a purely quantitative methodology is limited in explanatory power and whilst it may offer descriptions of formal relationships within a population at a particular time and space, it actually does not provide insights which are generalisable (see appendix 4.1). It also aligns with the views of Levinthal (1995) highlighted in chapter 2 that

quantitative tools traditionally applied in economic are unsuitable for researching topics relating to change.

Based on the arguments outlined above, qualitative approaches appear to be more appropriate to researching matters of how dynamic capabilities are deployed. However, it is also clear that qualitative approaches have flaws and pitfalls. As Easterby-Smith et al (2002, p129) observe, qualitative approaches can be influenced significantly by the biases of the researcher, rely on appropriate choices being made by the researcher as to which interpretive frames are applied when and are subject to practical difficulties such as gaining public access to private experiences. Creswell and Plano-Clark (2007, pp8-9) suggest that “the combination of quantitative and qualitative approaches provides a better understanding of research problems than either approach alone.” Such a mixed method approach is argued to have several benefits – qualitative and quantitative approaches have relative strengths which can account for the other approaches’ weaknesses, together they provide more comprehensive evidence and a mixed methods approach increases the arsenal of research options available to the researcher when addressing the practicalities of a particular research question.

The system of methods applied in this thesis (represented in diagram 4.1) is predominantly qualitative with case study narratives, retrodution and interpretation at the core of analysis. However, quantitative techniques are not completely eschewed. Indeed, quasi-statistics provided a practical and accessible means to operationalise the conceptual framework and contributed to the development of the study’s propositions. As such, it could be argued that the methodology adopted in this thesis aligns with a QUAL(quan)¹⁶ embedded mixed methods design as advocated by Cresswell and Plano-Clark (2007, p85). Furthermore, it appears that a QUAL(quan) design is used by Salvato (2009) in his study of the micro-processes of dynamic capabilities in Alessi, the extant empirical study with which the approach of this thesis best aligns.

¹⁶ QUAL(quan) is the notation suggested by Cresswell and Plano-Clark to denote a primarily qualitative approach which draws on quantitative techniques during analysis.

As such, it is argued that this thesis provides evidence that a QUAL (quan) design can be used to investigate dynamic capabilities in practice and that in doing so, the benefits of a mixed approach described above are harnessed. For example, participant observation allowed the researcher to develop tacit understanding of dynamic capabilities deployment and subsequent retroductive analysis retained this depth of qualitative understanding during explanation building. This activity was guided by a conceptual framework operationalised through quantitative quasi-statistics, effectively acting as a compass through the substantial volume of rich case data.

In summary, the arguments developed in this thesis support the view that the nature of dynamic capabilities as an object of enquiry renders a purely quantitative methodology inappropriate as a research approach for the topic. However, also supported is the view that the use of quantitative techniques within a qualitatively oriented mixed methods design can usefully provide structure to guide the analysis of dynamic capabilities in practice.

Limitations of this study

This chapter has discussed and proposed a series of implications for theory and practice raised by this thesis. It is also important to temper this with a balanced review of the limitations of this study, a task which this section endeavours to complete.

Chapter 1 introduced the overall aim of this thesis as making a contribution to understanding of how dynamic capabilities are deployed in practice. The author's practitioner background and critical realist philosophical position were made explicit and highlighted as likely influences on the approach undertaken. Consequently, the research design and argumentation of this thesis have been developed from a specific point of view and in this way, represented a limited contribution to the research aim. As has been discussed throughout the thesis, researchers with different experiences and preferences might explore the research topic in very different ways, and the

findings developed are bounded by inherent critical realist and practitioner perspectives.

Chapter 2 explained the theoretical foundations adopted for the thesis based on the findings of a structured literature review and Helfat et al's (2007) definitions of dynamic capabilities at different levels. The structured literature review has many merits as already discussed but equally, it introduces further limitations. Journal ranking criteria were adopted as filters specifically to direct attention towards the more widely regarded and rigorously peer-reviewed contributions. However, by giving preference to highly rated journals, a large body of literature was ignored. 183 papers were reviewed from the selected journals but if the journal selection criterion is removed, in the time period under review, a total of 426 papers are identified through the ABI database (i.e. 43% of potentially relevant available papers were selected for review). As such, the theoretical foundations of the thesis are somewhat bounded. Also, whilst Easterby-Smith et al (2009) strongly advocate the use of Helfatian definitions as unifying conceptual anchors, others such as Barreto (2010) choose to develop their own definitions better in line with their own views of the world. Therefore, it is accepted that the argumentation subsequently presented in this thesis is influenced by the choice of definitions for dynamic capabilities.

The conceptual framework in chapter 3 further illustrates the influence of a critical realist perspective on the contribution made by this thesis. Whilst the methodology, argumentation and supporting evidence were made explicit, also evident was the researcher's interpretation of the factors which are necessary or contingent to dynamic managerial capabilities deployment. It is inescapable that a bias was therefore introduced which influenced the form of the emergent conceptual framework

The methodology developed in chapter 4 placed the researcher as an instrument at the centre of data collection and adopted predominantly qualitative means of analysing data. As discussed in chapter 4, this introduces a significant potential for

bias against which attempts at mitigation were made through corroboration and triangulation.

The empirical findings of chapter 5 are based on the in depth investigation of two organisations located in close proximity in the West of Scotland, operating in the same traditional industrial sector and drawing from a similar pool of human resource. The findings of this thesis might therefore be argued to be limited by the research context although, as suggested in chapter 4, the findings are intended to be analytically generalisable and such contribute towards mid-range theoretical outcomes.

The discussions of Chapter 6 and 7 hinged on theoretical and analytical choices by the researcher underpinned by both a critical realist philosophical perspective and a practitioner leaning. For example, the selection of the transformational model of social activity as a basis for the development of a strategy as practice analysis in chapter 6 inevitably had a profound impact on the nature of the outputs identified thereafter. Overall, as the thesis progressed towards identifying specific implications and contributions, the impact of the underlying researcher preferences and predilections grew stronger.

Overall, it is recognised that this study, as is the case with any research project (Easterby-Smith et al, 2002), is flawed. In particular, this thesis is restricted in the contribution it can make by the context and circumstances of the organisations under investigation and the philosophical position, experience, research design and decision criteria of the author. Countermeasures already undertaken to address these limitations have been described throughout the thesis and the following chapter will outline a research agenda for future studies which might further account for the weaknesses of this thesis' approach. Therefore, it is hoped that McGrath's (1981) call to conduct flawed research in an acceptable way has been met.

In summary

This chapter has proposed a range of implications for dynamic capabilities theorising and practice.

Diagram 7.1 illustrates a theoretical model of dynamic managerial capabilities deployment based on the review of literature, conceptual model, empirical findings and subsequent analysis through a strategy as practice lens. It is argued to align with existing dynamic managerial capabilities literature whilst offering a number of extensions. Specifically, a more comprehensive model of factors influencing deployment practice, including the impact of mitigating factors, is suggested than is available in extant literature. Learning effects are argued to be inevitable and the resource of management is argued to be a principal constraint on the deployment of dynamic capabilities in an organisation.

The theoretical model is argued to provide a point of departure for further investigation of specific necessary factors influencing deployment and the development of dynamic capabilities in practice. It also arguably provides a means to link operationally the leverage of business resources (as proposed by the resource based view) with purposeful change to the resource base through dynamic capabilities.

The conceptual map developed in chapter 2 was argued to be confirmed in the main by the research findings. One source of disagreement was the vulnerability of dynamic capabilities to environmental change; the thesis aligned with the view that uncertainty is a greater determinant of the performance of dynamic capabilities than discontinuity (which may even serve to enhance the performance of dynamic capabilities deployment).

The interconnected, dynamic nature of deployment events over time suggested by the research findings imply that at an organisational level, an open systems model of the firm provides an appropriate framework to progress research into dynamic capabilities deployment practice. Accordingly, idiographic rather than nomothetic approaches are nominated as valid strategies to do so.

Dynamic capabilities are argued to be both durable and situational on account of their constituent mix of agential and routine components. The need to respond situationally is argued to render infeasible the notion of detailed best practice approaches to dynamic capabilities modelling; instead, detailed low level modelling of dynamic capabilities practice is encouraged to develop understanding of how the mechanisms of dynamic capabilities deployment operate. It is argued that such understanding might form the basis for abstract managerial prescription and training which individual managers might shape into effective local practice according to their context.

The notion of dynamic amplitude is also raised as a consideration for managers where amplitude reflects the availability of managerial resource to enact an intended change project to the required level of performance in light of all other resource loadings. It is suggested that the activity systems models developed in chapter 6 might form the basis of a managerial resource planning approach which helps assess the feasibility of available deployment opportunities.

In the development of intangible resources, the research findings of this thesis are argued to imply that a long term view must be adopted in place of a short term “efficiency” focus. A real options approach is suggested to create the likelihood of being able to meet potential future needs without over-committing managerial resource in the present.

The chapter concludes with a critique of the approach adopted. The approach of the thesis is argued to provide evidence in favour of the extension of the structured literature review method to incorporate forms of meta-data according to the particular focus of the study. Exclusively quantitative methodologies are argued to support only description of dynamic capabilities effects. However, it is suggested that quantitative methods might play a far more useful role as part of a mixed methods approach. In particular, an embedded QUAL(quan) mixed methods research design is argued to facilitate the investigation of dynamic capabilities practice. Weaknesses in the approach of the thesis are recognised relating to the influence of

researcher preferences, research design and bounded empirical setting. It is argued that all research projects have vulnerabilities of some shape or form and that countermeasures have been deployed throughout the thesis to minimise the effects.

The following chapter brings the thesis to a close by reflecting on the high level outputs created and proposing an agenda for future development of the findings and implications discussed in this chapter.

Chapter 8 – Conclusions

“Life is the art of drawing sufficient conclusions from insufficient premises”

Samuel Butler
(1835-1902)

Executive Summary

This brief chapter draws the thesis to a close by addressing the questions:-

- How have the research aims been addressed?
- What specific contributions has this thesis made?
- How can the research be developed further?

It is argued that the initial aim of developing understanding of how dynamic capabilities are deployed in practice has been addressed from an academic perspective consistent with a critical realist philosophical position. Also, the initial motivating question of, “As a manager, what should I do to effect appropriate change?” is also argued to be addressed from a practice perspective.

The main unique theoretical contribution to knowledge is identified as the model of dynamic managerial capabilities deployment practice. Secondary contributions to knowledge are also argued to be the extension to the structured literature review model and the justification of a QUAN(qual) embedded mixed methods design as a vehicle for investigating dynamic capabilities. The main unique contribution to practice is identified as the activity systems diagrams and associated framework of situational deployment.

It is suggested that the theoretical contributions of this thesis should be developed further by testing the deployment model in different settings; refining the research approach to explore practice oriented modes of dynamic capabilities development and formalising an extended structured literature review approach. An agenda for developing the practice outputs into managerial education and deployment tools is also proposed.

How have the research aims been addressed?

In chapter 1, the overarching aim of this thesis was identified as making a contribution to understanding of how dynamic capabilities are deployed in practice. Such an endeavour was suggested to be important given the role that dynamic capabilities arguably play in the survival and growth of an organisation through delivering purposeful change to the resource base. Furthermore, a motivation for addressing such an aim was revealed from the author's personal experience as a practising manager in a multi-national manufacturer. Operating in an uncertain environment with a constant need to change, the recurrent question of "As a manager, what should I do to effect appropriate change?" served as an inspiration for developing understanding of dynamic capabilities in practice.

Based on the activities and arguments described in the preceding seven chapters, it is argued that this study has addressed the initial research aim from two key perspectives. Firstly, theory has been generated which addresses the aim of how dynamic capabilities are deployed in practice from an academic perspective. As will be outlined below, a theoretical model of dynamic managerial capabilities deployment practice has been developed based on empirical investigation. Furthermore, theoretical assertions are made about the deployment of dynamic capabilities at an organisational level. These outputs are not argued to be definitive but rather are positioned as contributions developing the academy's understanding of the machinations of dynamic capabilities deployment.

Secondly, the research aims have been addressed from a practice perspective. Enabled by a longitudinal, participatory data collection approach and analysis from a strategy as practice perspective, a series of outputs have been created which provide partial answers to the motivating question of what managers should do to effect appropriate change. These are represented diagrammatically in a series of dynamic managerial capabilities deployment practice configurations and an approach to maximising their effectiveness and efficiency is suggested. These findings help

explain how dynamic managerial capabilities are deployed in practice and offer the potential to be developed into managerial aids to understanding and harnessing dynamic capabilities.

What specific contributions has this thesis made?

Based on evaluation of extant literature and the development of an appropriate research design, the overall research aims of this thesis were shaped into targeted contributions to knowledge at the conclusion of chapter 4. From the outcomes of subsequent research activities, a broad range of implications, impacts and contributions were suggested in chapter 7 which are summarised below.

Theoretical contributions

The main unique theoretical contribution to knowledge is identified as the model of dynamic managerial capabilities deployment practice depicted in diagram 7.1. As explained more fully in chapter 7, this model is a refinement of the literature based conceptual framework in light of the research findings and strategy as practice analysis. This model aligns with extant literature but also extends it in key ways and provides a point of departure for further development of understanding as to how dynamic capabilities operate in practice.

Contributions to methodological practice are also argued to be delivered by this thesis. Firstly, an extension to the structured literature review technique is proposed which incorporates the notion of meta-data to improve the depth of understanding about the contributions made to a particular topic. Secondly, at various stages of the thesis arguments refuting the appropriateness of purely quantitative methods to dynamic capabilities research lay the foundations for a proposal to reposition quantitative approaches within a qualitatively-oriented mixed methods design as a vehicle for investigating the micro-processes and activities of dynamic capabilities in practice. This design approach, as exemplified by diagram 4.1, is argued to offer a blue print for related future studies

Practical contribution

The main unique contribution to practice is identified as the activity systems diagrams and associated framework of situational deployment approaches as represented in diagrams 6.13. These models are argued to represent analytically generalisable findings which might be communicated to managers to stimulate reflection about their approach to purposefully changing the resource base. These models offer explanations as to how different approaches have different effects (in terms of efficacy and efficiency) according to situation without offering detailed normative models which arguably might be tied to particular circumstances.

How can the research be developed further?

Several further research activities might be proposed in response to both the contributions of this thesis and its limitations.

Firstly, it is argued that there is value in further testing the theoretical model identified in diagram 7.1 in different organisational settings. On a simple matter of validity, this could provide the opportunity to either refine or confirm the form of the model. However, as Whetten (1989) suggests, the setting in which this reapplication is conducted should be sufficiently different to the contexts examined in the initial study in order to maximise the theoretical merit of such an endeavour. In this case, an interesting differentiator might be industrial sector ‘clockspeed’¹⁷ (Fine, 1998). Eisenhardt and Martin (2000) propose that a boundary condition for the form of dynamic capabilities is market velocity. Given that both case contexts in this study were in a traditional manufacturing sector, selecting a contrasting sector such as financial services (argued by Barney (2002) to be particularly vulnerable and volatile) in which to reapply the model could be of theoretical value.

¹⁷ Clockspeed is a term borrowed from computer science (a computer’s ‘clock’ triggers activity) to describe the synchronised pace of activity in an organisation or industry

Secondly, as highlighted in chapter 7, the model could serve as a point of departure for related investigations. The notion of a dynamic resource based view could be advanced by developing an RBV oriented model of managerial resource and connecting it to the theoretical model in diagram 7.1 through the relevant deployment factors. Through longitudinal study, it may be possible to develop better understanding of how organisational resources such as managers or culture are leveraged over time, even in dynamic circumstances, to deliver favourable changes to the resource base through the mechanisms of dynamic capabilities. In line with views already expressed in this thesis, such a study could address all attempts at leverage- not just successful ones – to move towards theory which explains and operationalises the RBV (Montgomery, 1995)

Furthermore, through additional empirical investigation the theoretical model could be interrogated for its applicability to situations of stability or exploitation of resources. Is diagram 7.1 actually a model of managerial deployment practice in general (rather than just dynamic capabilities)? If so, could this model represent a contribution to strategy as practice literature by offering an explanation of what managers do in pursuit of strategic goals? Also, if the managerial level model in diagram 7.1 is applicable to both exploitation and exploration practice, what are the implications for organisational level ambidexterity? As dynamic capabilities literature is integrative (Zollo and Winter, 2002, Teece and Dosi, 1994, Augier and Teece, 2009), there are equally many possibilities to link dynamic capabilities practice findings to related theories.

Thirdly, the theoretical model developed in this thesis focuses on deployment of dynamic managerial capabilities and suggests that outcomes and learning link deployment events over time. However, it is opaque about how these links between events actually transpire and are managed (if at all). Are they intentional? Can they be enhanced with the use of deliberate learning mechanisms as suggested by authors such as Doz (1997), Zollo and Winter (2002) and Easterby-Smith and Prieto (2008)? If so, how do managers do this in practice? Addressing these questions could further

develop the theoretical model of deployment and enhance understanding of the practice of dynamic capabilities.

The author has an interest in the use of data and software support to enhance management research activities. Accordingly, the notions of an enhanced structured literature review will be further developed in two ways. On the basis of the findings in the current thesis, the range of meta-data outputs will be expanded and examined for findings of sufficient merit to warrant publication. Secondly, the process of and mechanisms for capturing meta-data will be formalised and shared through internal workshop with a view to developing a publication.

Relating to practice, several outputs could be developed. Firstly, management education material could be created. Following the flow of this thesis, such material could raise awareness about the nature of dynamic capabilities, activity system configurations and how deployment practices can be matched to situational needs. This could enable managers to better reflect on their approach to deployment in practice. Secondly, as suggested in chapter 7, a managerial resource planning tool could be created to enable managers to develop a more informed approach to the deployment of dynamic capabilities in their organisation. This could incorporate tools to support a real options approach towards handling the long term development of intangible resources.

In Conclusion

The strategic management topic of dynamic capabilities has the potential to support managers in the daunting task of steering an organisation through the uncertain waters of 21st century competition. This thesis has advanced understanding about how dynamic capabilities might be deployed in practice through the creation of a theoretical model grounded in empirical data. The research approach has drawn on multiple influences and methods around the core aim of generating understanding which might benefit both practitioners and academics. It has attempted to do so in a manner consistent with the philosophical position and motivations of the author. As with all research projects, it has its weaknesses but overall, it is hoped that the work

presented in this volume has made a useful contribution to knowledge in a coherent and acceptable way.

Based on the increasing level of publications in the field and the continuing tumultuous operating environments facing organisations, dynamic capabilities are anticipated to remain a topic of interest. According to Helfat et al (2007, p120) – “We have a plethora of opportunities for exploration of dynamic capabilities - more than enough to exploit in the coming years.” Arguably, this thesis provides evidence to suggest that further exploration and explanation of how dynamic capabilities operate in practice might yield insights of benefit to both the academic and business worlds.

References

- ABS. 2010. *The Association of Business Schools Website* [Online]. Available: www.the-abs.org.uk [Accessed 16th January 2010].
- ACKROYD, S. & FLEETWOOD, S. 2000. Realism in contemporary organisation and management studies. *Realist Perspectives on Management and Organisations*. London: Routledge.
- ADNER, R. & HELFAT, C., E. 2003. Corporate effects and dynamic managerial capabilities. *Strategic Management Journal*, 24, 1011-1025.
- AGARWAL, R. & SELEN, W. 2009. Dynamic Capability Building in Service Value Networks for Achieving Service Innovation. *Decision Sciences*, 40, 431.
- AMBROSINI, V. & BOWMAN, C. 2009. What are dynamic capabilities and are they a useful construct in strategic management? *International Journal of Management Reviews*, 11, 29-49.
- AMBROSINI, V., BOWMAN, C. & COLLIER, N. 2009. Dynamic Capabilities: An Exploration of How Firms Renew their Resource Base. *British Journal of Management*, 20, 9-24.
- AMIT, R. & SCHOEMAKER, P. J. H. 1993. Strategic assets and organizational rent. *Strategic Management Journal*, 14, 33-46.
- ANAND, G., WARD, P., TATIKONDA, M. & SCHILLING, D. 2009. Dynamic capabilities through continuous improvement infrastructure. *Journal of Operations Management*, 27, 444.
- ARAGÓN-CORREA, J. A. & RUBIO-LÓPEZ, E., A. 2007. Proactive Corporate Environmental Strategies: Myths and Misunderstandings. *Long Range Planning*, 40, 357.
- ARAGON-CORREA, J. A. & SHARMA, S. 2003. A contingent resource-based view of proactive corporate environmental strategy. *Academy of Management Review*, 28, 71.
- ARCHER, M. 1995. Realism and Morphogenesis. *Realist Social Theory: The Morphogenetic approach*. Cambridge: Cambridge University Press.
- ATHREYE, S., KALE, D. & RAMANI, S. 2009. Experimentation with strategy and the evolution of dynamic capability in the Indian pharmaceutical sector. *Industrial and Corporate Change*, 18, 729.
- ATHREYE, S., S. 2005. The Indian software industry and its evolving service capability. *Industrial and Corporate Change*, 14, 393.
- AUGIER, M. & TEECE, D., J. 2008. Strategy as Evolution with Design: The Foundations of Dynamic Capabilities and the Role of Managers in the Economic System. *Organization Studies*, 29, 1185.
- AUGIER, M. & TEECE, D., J. 2009. Dynamic Capabilities and the Role of Managers in Business Strategy and Economic Performance. *Organization Science*, 20, 410-421.
- AZADEGAN, A., BUSH, D. & DOOLEY, K., J. 2008. Design creativity: static or dynamic capability? *International Journal of Operations & Production Management*, 28, 636.

- BANKER, R., D. , BARDHAN, I., R. , CHANG, H. & LIN, S. 2006. Plant Information Systems, Manufacturing Capabilities, and Plant Performance. *MIS Quarterly*, 30, 315.
- BARNETT, M., L. 2005. Paying attention to real options. *R & D Management*, 35, 61.
- BARNEY, J. B. 1986. Strategic Factor Markets: Expectations, Luck, and Business Strategy. *Management Science*, 32, 1231.
- BARNEY, J.B. 1991. Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17, 99-120.
- BARNEY, J.B. 2002. *Gaining and Sustaining Competitive Advantage*, Prentice Hall.
- BARRETO, I. 2010. Dynamic Capabilities: A Review of Past Research and an Agenda for the Future. *Journal of Management*, 36, 256.
- BENNER, M. 2009. Dynamic or Static Capabilities? Process Management Practices and Response to Technological Change. *The Journal of Product Innovation Management*, 26, 473.
- BENNER, M., J. & TUSHMAN, M., L. 2003. Exploitation, exploration, and process management: The productivity dilemma revisited. *Academy of Management Review*, 28, 238.
- BHASKAR, R. 1975. *A Realist Theory of Science.*, London, Verso.
- BHATT, G., D & GROVER, V. 2005. Types of Information Technology Capabilities and Their Role in Competitive Advantage: An Empirical Study. *Journal of Management Information Systems*, 22, 253.
- BIERLY, P. E., III & CHAKRABARTI, A. K. 1996. Technological learning, strategic flexibility, and new product development in the pharmaceutical industry. *IEEE Transactions on Engineering Management*, 43, 368.
- BLOMQUIST, K., HARA, V., KOIVUNIEMI, J. & AIJO, T. 2004. Towards networked R&D management: the R&D approach of Sonera Corporation as an example. *R & D Management*, 34, 591.
- BLYLER, M. & COFF, R., W. 2003. Dynamic capabilities, social capital and rent appropriation: Ties that split pies. *Strategic Management Journal*, 24, 677.
- BOWMAN, C. & AMBROSINI, V. 2003. How the Resource-based and the Dynamic Capability Views of the Firm Inform Corporate-level Strategy. *British Journal of Management*, 14, 289-303.
- BRUNI, D. S. & VERONA, G. 2009. Dynamic Marketing Capabilities in Science-based Firms: an Exploratory Investigation of the Pharmaceutical Industry. *British Journal of Management*, 20, S101–S117.
- BUENSTORF, G. & MURMANN, J. P. 2005. Ernst Abbe's scientific management: theoretical insights from a nineteenth-century dynamic capabilities approach. *Industrial and Corporate Change*, 14, 543.
- BUTLER, T. & MURPHY, C. 2008. An exploratory study on IS capabilities and assets in a small-to-medium software enterprise. *Journal of Information Technology*, 23, 330.
- CAMPBELL, A. & SOMMER LUCHS, K. 1997. Understanding Competencies. In: CAMPBELL, A. & SOMMER LUCHS, K. (eds.) *Core Competency-Based Strategy*. London: International Thompson Business Press.
- CAMUFFO, A. & VOLPATO, G. 1996. Dynamic Capabilities and Manufacturing Automation: Organisational Learning in the Italian Automobile Industry. *Industrial and Corporate Change*, 5, 35.

- CAPRON, L. & MITCHELL, W. 2009. Selection Capability: How Capability Gaps and Internal Social Frictions Affect Internal and External Strategic Renewal. *Organization Science*, 20, 294.
- CARPENTER, M., A. , SANDERS, W. G. & GREGERSEN, H., B. 2001. Bundling human capital with organizational context: The impact of international assignment experience on multinational firm performance and CEO pay. *Academy of Management Journal*, 44, 493.
- CARROLL, L. 1946. *Through the Looking Glass and What Alice Found There*, New York, Random House.
- CEPEDA, G. & VERA, D. 2007. Dynamic capabilities and operational capabilities: A knowledge management perspective. *Journal of Business Research*, 60, 426.
- CETINDAMAR, D., PHAAL, R. & PROBERT, D. 2009. Understanding technology management as a dynamic capability: A framework for technology management activities. *Technovation*, 29, 237.
- CHANG, Y.-C. 2003. Benefits of co-operation on innovation performance: Evidence from integrated circuits and biotechnology firms in the UK and Taiwan. *R & D Management*, 33, 425.
- CHASE, R.B., JACOBS, F.R., AQUILANO, N.J. 2004 *Operations Management for Competitive Advantage*, McGraw-Hill, New York,
- CHECKLAND, P. & HOLWELL, S. 1998. Action Research: Its Nature and Validity. *Systemic Practice and Action Research*, 11, 9.
- CHI, T. & SETH, A. 2009. A dynamic model of the choice of mode for exploiting complementary capabilities. *Journal of International Business Studies*, 40, 365.
- COHEN, W. M. & LEVINTHAL, D. A. 1990. Absorptive Capacity: A New Perspective On Learning And Innovation. *Administrative Science Quarterly*, 35, 128.
- COLLIER, A. 1989. Stratified Explanation and Marx's conception of history. *Scientific realism and Socialist Thought*. Harvester Wheatsheaf.
- COLLIS, D. J. 1994. Research note: How valuable are organizational capabilities? *Strategic Management Journal*, 15, 143-152.
- COOL, K., COSTA, L. A. & DIERICKX, I. 2002. Constructing Competitive Advantage. In: PETTIGREW, A., THOMAS, H. & WHITTINGTON, R. (eds.) *Strategy Management*. London: Sage Publications.
- CORBETT, A.C. (2005) Experiential Learning Within the Process of Opportunity Identification and Exploitation. *Entrepreneurship Theory and Practice*, 29, 4, p473
- COUGHLAN, P. & COGHLAN, D. 2002. Action research for operations management. *International Journal of Operations & Production Management*, 22, 220.
- CRESSWELL, J. W. & PLANO CLARK, V. L. 2007. *Designing and Conducting Mixed Methods Research*, London, Sage.
- D'ADDERIO, L. 2001. Crafting the virtual prototype: How firms integrate knowledge and capabilities across organisational boundaries. *Research Policy*, 30, 1409.
- DANNEELS, E. 2008. Organizational antecedents of second-order competences. *Strategic Management Journal*, 29, 519.

- DAVIES, J. B., ROSS, A., WALLACE, B., & WRIGHT, L. (2003). *Safety Management: a Qualitative Systems Approach*. London: Taylor and Francis.
- DELMAS, M., A. 1999. Exposing strategic assets to create new competencies: The case of technological acquisition in the waste management industry in Europe and North America. *Industrial and Corporate Change*, 8, 635.
- DENYER, D. & TRANFIELD, D. 2006. Using qualitative research synthesis to build an actionable knowledge base. *Management Decision*, 44, 213.
- DENZIN, N. K. & LINCOLN, Y. S. 2000. The Discipline and Practice of Qualitative Research. In: DENZIN, N. K. & LINCOLN, Y. S. (eds.) *Handbook of Qualitative Research*. 2nd ed. London: Sage Publications Inc.
- DIERICKX, I., COOL, K. & BARNEY, J. B. 1989. Asset Stock Accumulation And Sustainability Of Competitive. *Management Science*, 35, 1504-1513.
- DIXON, S., MEYER, K. & DAY, M. 2010. Stages of Organizational Transformation in Transition Economies: A Dynamic Capabilities Approach. *Journal of Management Studies*, 47, 416.
- DOBSON, P., J. 2001. Longitudinal Case Research: A Critical Realist Perspective. *Systemic Practice and Action Research*, 14, 283.
- DØVING, E. & GOODERHAM, P. 2008. Dynamic capabilities as antecedents of the scope of related diversification: the case of small firm accountancy practices. *Strategic Management Journal*, 29, 841.
- EASTERBY-SMITH, M., LYLES, M., A. & PETERAF, M., A. 2009. Dynamic Capabilities: Current Debates and Future Directions. *British Journal of Management*, 20, S1- S8.
- EASTERBY-SMITH, M. & PRIETO, I., M. 2008. Dynamic Capabilities and Knowledge Management: an Integrative Role for Learning? *British Journal of Management*, 19, 235–249.
- EASTERBY-SMITH, M., THORPE, R. & LOWE, A. 2002. *Management Research: An Introduction*, London, Sage Publications.
- EASTON, G. 2000. Case Research for Industrial Networks: A realist apologia. In: ACKROYD, S. & FLEETWOOD, S. (eds.) *Realist Perspectives on Management and Organisations*. London: Routledge.
- EDEN, C. & HUXHAM, C. 1996. Action research for management research. *British Journal of Management*, 7, 75.
- EDEN, C. & HUXHAM, C. 2002. Action Research. In: PARTINGTON, D. (ed.) *Essential Skills for Management Research*. London: Sage Publications.
- EGGERS, J. & KAPLAN, S. 2009. Cognition and Renewal: Comparing CEO and Organizational Effects on Incumbent Adaptation to Technical Change. *Organization Science*, 20, 461.
- EISENHARDT, K. M. & MARTIN, J. A. 2000. Dynamic capabilities: What are they? *Strategic Management Journal*, 21, 1105.
- ELLONEN, H., WIKSTRÖM, P. & JANTUNEN, A. 2009. Linking dynamic-capability portfolios and innovation outcomes. *Technovation*, 29, 753.
- ETTLIE, J., E. & PAVLOU, P., A. 2006. Technology-Based New Product Development Partnerships. *Decision Sciences*, 37, 117.
- FANG, E. & ZOU, S. 2009. Antecedents and consequences of marketing dynamic capabilities in international joint ventures. *Journal of International Business Studies*, 40, 742.

- FILATOTCHEV, I. & PIESSE, J. 2009. R&D, internationalization and growth of newly listed firms: European evidence. *Journal of International Business Studies*, 40, 1260.
- FINK, L. & MARKOVICH, S. 2008. Generic verticalization strategies in enterprise system markets: An exploratory framework. *Journal of Information Technology*, 23, 281.
- FINK, L. & NEUMANN, S. 2009. Exploring the perceived business value of the flexibility enabled by information technology infrastructure. *Information & Management*, 46, 90.
- FIXSON, S., K. 2005. Product architecture assessment: a tool to link product, process, and supply chain design decisions. *Journal of Operations Management*, 23, 345.
- FLORICEL, S. & IBANESCU, M. 2008. Using R&D portfolio management to deal with dynamic risk. *R & D Management*, 38, 452.
- FORRANT, R. & FLYNN, E. 1999. Skills, shop-floor participation and the transformation of brimfield precision: Lessons for the revitalization of the metal-working sector. *Industrial and Corporate Change*, 8, 167.
- FOSS, N., J. 2003. Selective intervention and internal hybrids: Interpreting and learning from the rise and decline of the Oticon spaghetti organization. *Organization Science*, 14, 331.
- FOSS, N. J. & ERIKSEN, B. 1995. Competitive Advantage and Industry Capabilities. In: MONTGOMERY, C. A. (ed.) *Resource-based and Evolutionary Theories of the Firm: Towards a Synthesis*. Boston: Kluwer Academic Publishers.
- GALUNIC, D. C. & EISENHARDT, K. M. 2001. Architectural innovation and modular corporate forms. *Academy of Management Journal*, 44, 1229-1249.
- GARCIA-MORALES, V., J. , LLORENS-MONTES, F. J. & VERDU-JOVER, A., J. 2007. Influence of personal mastery on organizational performance through organizational learning and innovation in large firms and SMEs. *Technovation*, 27, 547.
- GEORGE, G. 2005. Learning to be capable: patenting and licensing at the Wisconsin Alumni Research Foundation 1925-2002. *Industrial and Corporate Change*, 14, 119.
- GIDDENS, A. 1984. *The Constitution of Society. Outline of the Theory of Structuration*, Cambridge, Cambridge University Press.
- GILBERT, C., G. 2006. Change in the Presence of Residual Fit: Can Competing Frames Coexist? *Organization Science*, 17, 150.
- GRAETZ, F. & SMITH, A. 2008. The role of dualities in arbitrating continuity and change in forms of organizing. *International Journal of Management Reviews*, 10, 265.
- GRANT, R. M. 1991. The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation. *California Management Review*, 33, 114.
- GRANT, R.M. 2008 *Contemporary Strategy Analysis*, Oxford, Blackwell Publishing
- GREENHALGH, T. & PEACOCK, R. 2005. Effectiveness and efficiency of search methods in systematic reviews of complex evidence: audit of primary sources. *British Medical Journal*, 331, 1064-1065.

- GRIFFITH, D., A. & HARVEY, M., G. 2001. A resource perspective of global dynamic capabilities. *Journal of International Business Studies*, 32, 597.
- GUMMESSON, E. 2000. *Qualitative Methods in Management Research*, London, Sage Publications.
- HAMEL, G. 2007 *The Future of Management*, Boston, Harvard Business School Press.
- HARRELD, J. B., O'REILLY, I. C., A. & TUSHMAN, M., L. 2007. Dynamic Capabilities at IBM: Driving Strategy into Action. *California Management Review*, 49, 21.
- HARRIS, M., COLLINS, R. & HEVNER, A. 2009. Control of Flexible Software Development Under Uncertainty. *Information Systems Research*, 20, 400.
- HART, C. 1998. *Doing a Literature Review*, London, Sage Publications.
- HART, S., L. & SHARMA, S. 2004. Engaging Fringe Stakeholder for Competitive Imagination. *Academy of Management Executive*, 18, 7.
- HELFAT, C., E. 1997. Know-how and asset complementarity and dynamic capability accumulation: The case of R&D. *Strategic Management Journal*, 18, 339-360.
- HELFAT, C., E. 2000. Guest editor's introduction to the special issue: The evolution of firm capabilities. *Strategic Management Journal*, 21, 955-959.
- HELFAT, C., E. & PETERAF, M., A. 2003. The dynamic resource-based view: Capability lifecycles. *Strategic Management Journal*, 24, 997-1010.
- HELFAT, C. E., FINKLESTEIN, S., MITCHELL, W., PETERAF, M. A., SINGH, H., TEECE, D. J. & WINTER, S., G. 2007. *Dynamic Capabilities: Understanding Strategic Change in Organisations*, Oxford, Blackwell Publishing.
- HOLWEG, M. & PIL, F. K. 2008. Theoretical perspectives on the coordination of supply chains. *Journal of Operations Management*, 26, 389.
- IANSITI, M. & CLARK, K. B. 1994. Integration and Dynamic Capability: Evidence from Product Development in Automobiles and Mainframe Computers. *Industrial and Corporate Change*, 3, 49.
- JANESICK, V. J. 2000. The Choreography of Qualitative Research Design. In: DENZIN, N. K. & LINCOLN, Y. S. (eds.) *Handbook of Qualitative Research*. 2nd ed. London: Sage Publications Inc.
- JARRATT, D. 2008. Testing a theoretically constructed relationship management capability. *European Journal of Marketing*, 42, 1106.
- JARZABKOWSKI, P. 2005. *Strategy as Practice - an activity based approach*, London, Sage Publications.
- JOHNSON, G., LANGLEY, A., MELIN, L. & WHITTINGTON, R. 2005. *Strategy as Practice- Research Directions and Resources*, Cambridge, Cambridge University Press.
- JUDGE, W., Q. & BLOCKER, C., P. 2008. Organizational capacity for change and strategic ambidexterity. *European Journal of Marketing*, 42, 915.
- KALE, D. 2010. The Distinctive Patterns of Dynamic Learning and Inter-firm Differences in the Indian Pharmaceutical Industry. *British Journal of Management*, 21, 223.
- KALE, P. & SINGH, H. 2007. Building firm capabilities through learning: the role of the alliance learning process in alliance capability and firm-level alliance success. *Strategic Management Journal*, 28, 981.

- KARIM, S. 2006. Modularity in organizational structure: the reconfiguration of internally developed and acquired business units. *Strategic Management Journal*, 27, 5.
- KARIM, S. 2009. Business Unit Reorganization and Innovation in New Product Markets. *Management Science*, 55, 1237.
- KEMMIS, S. & MCTAGGART, R. 2000. Participatory Action Research. In: DENZIN, N. K. & LINCOLN, Y. S. (eds.) *Handbook of Qualitative Research*. 2nd ed. London: Sage Publications Inc.
- KING, A., A. & TUCCI, C., L. 2002. Incumbent entry into new market niches: The role of experience and managerial choice in the creation of dynamic capabilities. *Management Science*, 48, 171.
- KOR, Y., Y. & MAHONEY, J., T. 2005. How dynamics, management, and governance of resource deployments influence firm-level performance. *Strategic Management Journal*, 26, 489.
- KUHN, T. S. 1996. *The Structure of Scientific Revolutions: 3rd Edition*, Chicago, The University of Chicago Press.
- KWAN, K.-M. & TSANG, E., W. K. 2001. Realism and constructivism in strategy research: A critical realist response to MIR and Watson. *Strategic Management Journal*, 22, 1163.
- LAEEQUDDIN, M., SARDANA, G. D., SAHAY, B. S., WAHEED, K. A. & SAHAY, V. 2009. Supply chain partners' trust building process through risk evaluation: the perspectives of UAE packaged food industry. *Supply Chain Management*, 14, 280.
- LAMPEL, J. & SHAMSIE, J. 2003. Capabilities in Motion: New Organizational Forms and the Reshaping of the Hollywood Movie Industry. *Journal of Management Studies*, 40, 2189.
- LAVIE, D. 2006. Capability reconfiguration: an analysis of incumbent responses to technological change. *Academy of Management Review*, 31, 153.
- LAZONICK, W. & PRENCIPE, A. 2005. Dynamic capabilities and sustained innovation: strategic control and financial commitment at Rolls-Royce plc. *Industrial and Corporate Change*, 14, 501.
- LEE, H. & KELLEY, D. 2008. Building dynamic capabilities for innovation: an exploratory study of key management practices. *R & D Management*, 38, 155.
- LEE, J., LEE, K. & RHO, S. 2002. An evolutionary perspective on strategic group emergence: A genetic algorithm-based model. *Strategic Management Journal*, 23, 727.
- LEE, R. 2009. Social capital and business and management: Setting a research agenda. *International Journal of Management Reviews*, 11, 247.
- LEONARD-BARTON, D. 1992. Core Capabilities and Core Rigidities: A paradox in managing new product development. *Strategic Management Journal (1986-1998)*, 13, 111.
- LIAO, J. J., KICKUL, J. R. & MA, H. 2009. Organizational Dynamic Capability and Innovation: An Empirical Examination of Internet Firms. *Journal of Small Business Management*, 47, 263.
- LICHTENTHALER, U. 2009. Absorptive capacity, environmental turbulence, and the complementarity of organisational learning processes. *Academy of Management Journal*, 52, 822.

- LICHTENTHALER, U. & LICHTENTHALER, E. 2009. A Capability-Based Framework for Open Innovation: Complementing Absorptive Capacity. *Journal of Management Studies*, 46, 1315.
- LILLIS, B. & LANE, R. 2007. Auditing the strategic role of operations. *International Journal of Management Reviews*, 9, 191.
- LÓPEZ-MIELGO, N., MONTES-PEÓN, J. & VÁZQUEZ-ORDÁS, C. 2009. Are quality and innovation management conflicting activities? *Technovation*, 29, 537.
- LÓPEZ, S. V. 2005. Competitive advantage and strategy formulation: The key role of dynamic capabilities. *Management Decision*, 43, 661-669.
- LUO, Y. 2003. Market-seeking MNEs in an emerging market: How parent-subsidiary links shape overseas success. *Journal of International Business Studies*, 34, 290.
- MACCORMACK, A. & IANSITI, M. 2009. Intellectual Property, Architecture, and the Management of Technological Transitions: Evidence from Microsoft Corporation. *The Journal of Product Innovation Management*, 26, 248.
- MACHER, J., T. & MOWERY, D., C. 2009. Measuring Dynamic Capabilities: Practices and Performance in Semiconductor Manufacturing. *British Journal of Management*, 20, 41-60.
- MACPHERSON, A., JONES, O. & ZHANG, M. 2004. Evolution or revolution? Dynamic capabilities in a knowledge-dependent firm. *R & D Management*, 34, 161-177.
- MADHOK, A. & OSEGOWITSCH, T. 2000. The international biotechnology industry: A dynamic capabilities perspective. *Journal of International Business Studies*, 31, 325.
- MAHONEY, J. T. 1995. The management of resources and the resource of management. *Journal of Business Research*, 33, 91.
- MAKADOK, R. 2001. Toward a synthesis of the resource-based and dynamic-capability views of rent creation. *Strategic Management Journal*, 22, 387.
- MAKLAN, S. & KNOX, S. 2009. Dynamic capabilities: the missing link in CRM investments. *European Journal of Marketing*, 43, 1392.
- MALIK, O. & KOTABE, M. 2009. Dynamic Capabilities, Government Policies, and Performance in Firms from Emerging Economies: Evidence from India and Pakistan. *Journal of Management Studies*, 46, 421.
- MARCUS, A., A. & ANDERSON, M., H. 2006. A General Dynamic Capability: Does it Propagate Business and Social Competencies in the Retail Food Industry? *Journal of Management Studies*, 43, 19.
- MARSH, S., J. & STOCK, G., N. 2003. Building dynamic capabilities in new product development through intertemporal integration. *The Journal of Product Innovation Management*, 20, 136.
- MARSH, S. J. & STOCK, G. N. 2006. Creating Dynamic Capability: The Role of Intertemporal Integration, Knowledge Retention, and Interpretation. *The Journal of Product Innovation Management*, 23, 422.
- MATHEWS, J. A. 2003. Strategizing by Firms in the Presence of Markets for Resources. *Industrial and Corporate Change*, 12, 37.
- MATHEWS, J. A. 2010. Lachmannian Insights into Strategic Entrepreneurship: Resources, Activities and Routines in a Disequilibrium World. *Organization Studies*, 31, 219.

- MATHIASSEN, L. & VAINIO, A. M. 2007. Dynamic Capabilities in Small Software Firms: A Sense-and-Respond Approach. *IEEE Transactions on Engineering Management*, 54, 522.
- MAXWELL, J. A. 2005. *Qualitative Research Design - An Interactive Approach*, London, Sage.
- MCGRATH, J. E. 1981. Dilemmatics The Study of Research Choices and Dilemmas. *The American Behavioral Scientist (pre-1986)*, 25, 179.
- MCKELVIE, A. & DAVIDSSON, P. 2009. From Resource Base to Dynamic Capabilities: an Investigation of New Firms. *British Journal of Management*, 20, 63-80.
- MCNIFF, J. & WHITEHEAD, J. 2006. *All You Need to Know About Action Research*, London, Sage Publications.
- MENGUC, B. & BARKER, T. 2005. Re-examining field sales unit performance: Insights from the resource-based view and dynamic capabilities perspective. *European Journal of Marketing*, 39, 885.
- MERTON, R. K. 1968. *Social Theory and Social Structure*, New York, The Free Press.
- MIR, R. & WATSON, A. 2001. Critical realism and constructivism in strategy research: Toward a synthesis. *Strategic Management Journal*, 22, 1169.
- MOLITERNO, T., F. & WIERSEMA, M., F. 2007. Firm performance, rent appropriation, and the strategic resource divestment capability. *Strategic Management Journal*, 28, 1065.
- MÖLLER, K. & SVAHN, S. 2006. Role of Knowledge in Value Creation in Business Nets. *Journal of Management Studies*, 43, 985.
- MORGAN, N., VORHIES, D. & MASON, C. 2009. Market orientation, marketing capabilities, and firm performance. *Strategic Management Journal*, 30, 909.
- MOSEY, S. 2005. Understanding new-to-market product development in SMEs. *International Journal of Operations & Production Management*, 25, 114.
- MUTCH, A. 1999. Critical realism, managers and information. *British Journal of Management*, 10, 323.
- NARASIMHAN, O., RAJIV, S. & DUTTA, S. 2006. Absorptive Capacity in High-Technology Markets: The Competitive Advantage of the Haves. *Marketing Science*, 25, 510.
- NARAYANAN, V. K., COLWELL, K. & DOUGLAS, F., L. 2009. Building Organizational and Scientific Platforms in the Pharmaceutical Industry: A Process Perspective on the Development of Dynamic Capabilities. *British Journal of Management*, 20, S25-S40.
- NELSON, R. R. 1991. Why Do Firms Differ, and How Does It Matter? *Strategic Management Journal*, 12, 61.
- NELSON, R. R. & WINTER, S. G. 1982. *An Evolutionary Theory of Economic Change*, Cambridge MA, Harvard University Press.
- NEWBERT, S., GOPALAKRISHNAN, S. & KIRCHHOFF, B. 2008. Looking beyond resources: Exploring the importance of entrepreneurship to firm-level competitive advantage in technologically intensive industries. *Technovation*, 28, 6.
- NEWBERT, S., L. 2005. New Firm Formation: A Dynamic Capability Perspective. *Journal of Small Business Management*, 43, 55.

- NEWHEY, L., R. & ZAHRA, S., A. 2009. The Evolving Firm: How Dynamic and Operating Capabilities Interact to Enable Entrepreneurship. *British Journal of Management*, 20, 81-100.
- NG, D. W. 2007. A Modern Resource Based Approach to Unrelated Diversification. *Journal of Management Studies*, 44, 1481.
- O'CONNOR, G. 2008. Major Innovation as a Dynamic Capability: A Systems Approach. *The Journal of Product Innovation Management*, 25, 313.
- O'CONNOR, G. C. & DEMARTINO, R. 2006. Organizing for Radical Innovation: An Exploratory Study of the Structural Aspects of RI Management Systems in Large Established Firms. *The Journal of Product Innovation Management*, 23, 475.
- O'REILLY III, C., A., HARRELD, J. B. & TUSHMAN, M., L. 2009. Organizational Ambidexterity: IBM and Emerging Business Opportunities. *California Management Review*, 51, 75.
- O'REILLY III, C. A. & TUSHMAN, M. 2008. Ambidexterity as a dynamic capability: Resolving the innovator's dilemma. *Research in Organizational Behavior*, 28, 185.
- OLIVER, C. & HOLZINGER, I. 2008. The effectiveness of strategic political management: A dynamic capabilities framework. *Academy of Management Review*, 33, 496.
- OUTHWAITE, W. 1987. Realism and Social Science. *New Philosophies of Social Science*. Palgrave MacMillan.
- PABLO, A., L. , REAY, T., DEWALD, J., R. & CASEBEER, A., L. 2007. Identifying, Enabling and Managing Dynamic Capabilities in the Public Sector. *Journal of Management Studies*, 44, 687.
- PANDZA, K., HORSBURGH, S., GORTON, K. & POLAJNAR, A. 2003a. A real options approach to managing resources and capabilities. *International Journal of Operations & Production Management*, 23, 1010.
- PANDZA, K., POLAJNAR, A., BUCHMEISTER, B. & THORPE, R. 2003b. Evolutionary perspectives on the capability accumulation process. *International Journal of Operations & Production Management*, 23, 822.
- PANDZA, K. & THORPE, R. 2009. Creative Search and Strategic Sense-making: Missing Dimensions in the Concept of Dynamic Capabilities. *British Journal of Management*, 20, S118 - S131.
- PAVLOU, P., A. & EL SAWY, O., A. 2006. From IT Leveraging Competence to Competitive Advantage in Turbulent Environments: The Case of New Product Development. *Information Systems Research*, 17, 198.
- PENROSE, E. 1959. *The Theory of The Growth of The Firm*, Oxford, Basil Blackwell.
- PETERAF, M., A. 1993. The Cornerstones of Competitive Advantage: A resource-based view. *Strategic Management Journal (1986-1998)*, 14, 179.
- PETERAF, M., A. & BARNEY, J., B. 2003. Unraveling The Resource-Based Tangle. *Managerial and Decision Economics*, 24, 309-323.
- PETERAF, M. & REED, R. 2007. Managerial discretion and internal alignment under regulatory constraints and change. *Strategic Management Journal*, 28, 1089.
- PETRONI, A. 1998. The analysis of dynamic capabilities in a competence-oriented organization. *Technovation*, 18, 179.

- PIERCE, L. 2009. Big losses in ecosystem niches: how core firm decisions drive complementary product shakeouts. *Strategic Management Journal*, 30, 323.
- PIL, F. K. & COHEN, S., K. 2006. Modularity: Implications for Imitation, Innovation and Sustained Advantage. *Academy of Management Review*, 31, 995.
- PORTER, M. E. 1980. *Competitive Strategy*, New York, The Free Press.
- PORTER, M. E. 1984. *Competitive Advantage: Creating and Sustaining Superior Performance*, New York, The Free Press.
- PRATTEN, S. 2000. Structure, agency and Marx's analysis of the labour process. In: ACKROYD, S. & FLEETWOOD, S. (eds.) *Realist Perspectives on Management and Organisations*. London: Routledge.
- PRIEM, R., L. & BUTLER, J., E. 2001. Is the resource-based "view" a useful perspective for strategic management research? *Academy of Management Review*, 26, 22-40.
- REASON, P. & BRADBURY, H. 2006. Inquiry and Participation in Search of a World Worthy of Human Aspiration. In: REASON, P. & BRADBURY, H. (eds.) *Handbook of Action Research*. London: Sage.
- REED, M. I. 1997. In praise of duality and dualism: Rethinking agency and structure in organizational analysis. *Organization Studies*, 18, 21.
- REGNÉR, P. 2008. Strategy-as-practice and dynamic capabilities: Steps towards a dynamic view of strategy. *Human Relations*, 61, 565-588.
- RINDOVA, V., P. & KOTHA, S. 2001. Continuous "morphing": Competing through dynamic capabilities, form, and function. *Academy of Management Journal*, 44, 1263-1280.
- ROSENBLOOM, R., S. 2000. Leadership, capabilities, and technological change: The transformation of NCR in the electronic era. *Strategic Management Journal*, 21, 1083.
- ROTHAERMEL, F. & HESS, A. 2007. Building Dynamic Capabilities: Innovation Driven by Individual-, Firm-, and Network-Level Effects. *Organization Science*, 18, 898.
- RUMELT, R. P. 1995. Inertia and Transformation. In: MONTGOMERY, C. A. (ed.) *Resource-based and Evolutionary Theories of the Firm: Towards a Synthesis*. Boston: Kluwer Academic Publishers.
- RYAN, G. W. & BERNARD, H. R. 2000. Data Management and Analysis Methods. In: DENZIN, N. K. & LINCOLN, Y. S. (eds.) *Handbook of Qualitative Research*. 2nd ed. London: Sage Publications Inc.
- SALVATO, C. 2003. The role of micro-strategies in the engineering of firm evolution. *Journal of Management Studies*, 40, 83.
- SALVATO, C. 2009. Capabilities Unveiled: The Role of Ordinary Activities in the Evolution of Product Development Processes. *Organization Science*, 20, 384.
- SAMBAMURTHY, V., ANANDHI, B. & VARUN, G. 2003. Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary Firms1. *MIS Quarterly*, 27, 237.
- SANCHEZ, R. & HEENE, A. 1997. Managing for an uncertain future: A systems view of strategic organizational change. *International Studies of Management & Organization*, 27, 21.

- SARKIS, J., GONZALEZ-TORRE, P. & ADENSO-DIAZ, B. 2010. Stakeholder pressure and the adoption of environmental practices: The mediating effect of training. *Journal of Operations Management*, 28, 163.
- SAWERS, J., PRETORIUS, M. & OERLEMANS, L. 2008. Safeguarding SMEs dynamic capabilities in technology innovative SME-large company partnerships in South Africa. *Technovation*, 28, 171.
- SAYER, A. 1981. Abstraction - a realist interpretation. *Radical Philosophy*.
- SAYER, A. 1992. *Method in Social Science*, London, Routledge.
- SAYER, A. 2000. *Realism and Social Science*, London, Sage.
- SCHREYÖGG, G. & KLIESCH-EBERL, M. 2007. How dynamic can organizational capabilities be? Towards a dual-process model of capability dynamization. *Strategic Management Journal*, 28, 913.
- SHAMSIE, J., MARTIN, X. & MILLER, D. 2009. In with the old, in with the new: capabilities, strategies, and performance among the Hollywood studios. *Strategic Management Journal*, 30, 1440.
- SHER, P., J. & LEE, V., C. 2004. Information technology as a facilitator for enhancing dynamic capabilities through knowledge management. *Information & Management*, 41, 933.
- SIGUAW, J., A., SIMPSON, P., M. & ENZ, C., A. 2006. Conceptualizing Innovation Orientation: A Framework for Study and Integration of Innovation Research. *The Journal of Product Innovation Management*, 23, 556.
- SILVERMAN, D. 2003. *Interpreting Qualitative Data*, London, Sage Publications.
- SIRMON, D. G. & HITT, M. A. 2009. Contingencies within dynamic managerial capabilities: interdependent effects of resource investment and deployment on firm performance. *Strategic Management Journal*, 30, 1375.
- SKILTON, P. 2009. Knowledge based resources, property based resources and supplier bargaining power in Hollywood motion picture projects. *Journal of Business Research*, 62, 834.
- SLATER, S., F., OLSON, E., M. & HULT, G. T. M. 2006. The moderating influence of strategic orientation on the strategy formation capability-performance relationship. *Strategic Management Journal*, 27, 1221.
- SMART, P., BESSANT, J. & GUPTA, A. 2007. Towards technological rules for designing innovation networks: a dynamic capabilities view. *International Journal of Operations & Production Management*, 27, 1069.
- SONG, M., DROGE, C., HANVANICH, S. & CALANTONE, R. 2005. Marketing and technology resource complementarity: an analysis of their interaction effect in two environmental contexts. *Strategic Management Journal*, 26, 259.
- SSCI. 2010. *ISI Web of Knowledge Website* [Online]. Available: http://apps.isiknowledge.com/additional_resources.do?highlighted_tab=additional_resources&product=UA&SID=Q2nP1LK9HFmngFd19dB&cacheurl=no [Accessed 16th January 2010].
- STAKE, R. E. 1995. *The Art of Case Study Research*, London, Sage Publications.
- STAKE, R. E. 2000. Case Studies. In: DENZIN, N. K. & LINCOLN, Y. S. (eds.) *Handbook of Qualitative Research*. 2nd ed. London: Sage Publications Inc.
- SZULANSKI, G. 1996. Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal*, 17, 27.

- TANG, Y.-C. & LIOU, F.-M. 2010. Does firm performance reveal its own causes? the role of Bayesian inference. *Strategic Management Journal*, 31, 39.
- TAYLOR, A. & HELFAT, C. 2009. Organizational Linkages for Surviving Technological Change: Complementary Assets, Middle Management, and Ambidexterity. *Organization Science*, 20, 718.
- TEECE, D., J. 2006. Reflections on "Profiting from Innovation". *Research Policy*, 35, 1131.
- TEECE, D. J. 2007. Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28, 1319-1350.
- TEECE, D. J. 2009a. *Dynamic Capabilities and Strategic Management: Organising for Innovation and Growth*, Oxford, Oxford University Publishing.
- TEECE, D. J. 2009b. Dynamic Capabilities and the Essence of the Multinational Enterprise. *Dynamic Capabilities and Strategic Management: Organising for Innovation and Growth*. Oxford: Oxford University Publishing.
- TEECE, D. J. 2009c. The Nature of Competition in Regimes of Rapid Technological Change. *Dynamic Capabilities and Strategic Management: Organising for Innovation and Growth*. Oxford: Oxford University Publishing.
- TEECE, D. J. & DOSI, G. 1994. Preface: Dynamic Capabilities. *Industrial and Corporate Change*, 3, 1.
- TEECE, D. J. & PISANO, G. 1994. The Dynamic Capabilities of Firms: an Introduction. *Industrial and Corporate Change*, 3, 20.
- TEECE, D. J., PISANO, G. & SHUEN, A. 1997. Dynamic Capabilities and Strategic Management. *Strategic Management Journal*, 18, 509-533.
- THARENOU, P., DONOHUE, R. & COOPER, B. 2007. *Management Research Methods*, Cambridge, Cambridge University Press.
- TOWNSEND, J., CAVUSGIL, S. T. & BABA, M. 2010. Global Integration of Brands and New Product Development at General Motors. *The Journal of Product Innovation Management*, 27, 49.
- TRIPSAS, M. 1997. Surviving Radical Technological Change through Dynamic Capability: Evidence from the Typesetter Industry. *Industrial and Corporate Change*, 6, 341-377.
- TSANG, E., W. K. & KWAN, K.-M. 1999. Replication and theory development in organizational science: A critical realist perspective. *Academy of Management Review*, 24, 759.
- TSOUKAS, H. 1989. The Validity Of Idiographic Research Explanations. *Academy of Management Review*, 14, 551.
- TSOUKAS, H. 1994. What is management? An outline of a metatheory. *British Journal of Management*, 5, 289.
- UHLENBRUCK, K. 2004. Developing acquired foreign subsidiaries: the experience of MNEs in transition economies. *Journal of International Business Studies*, 35, 109.
- VAIDYANATHAN, G. & DEVARAJ, S. 2008. The role of quality in e-procurement performance: An empirical analysis. *Journal of Operations Management*, 26, 407.
- VAN DE VEN, A. H. 1992. Suggestions for Studying Strategy Process: A Research Note. *Strategic Management Journal*, 13, 169.

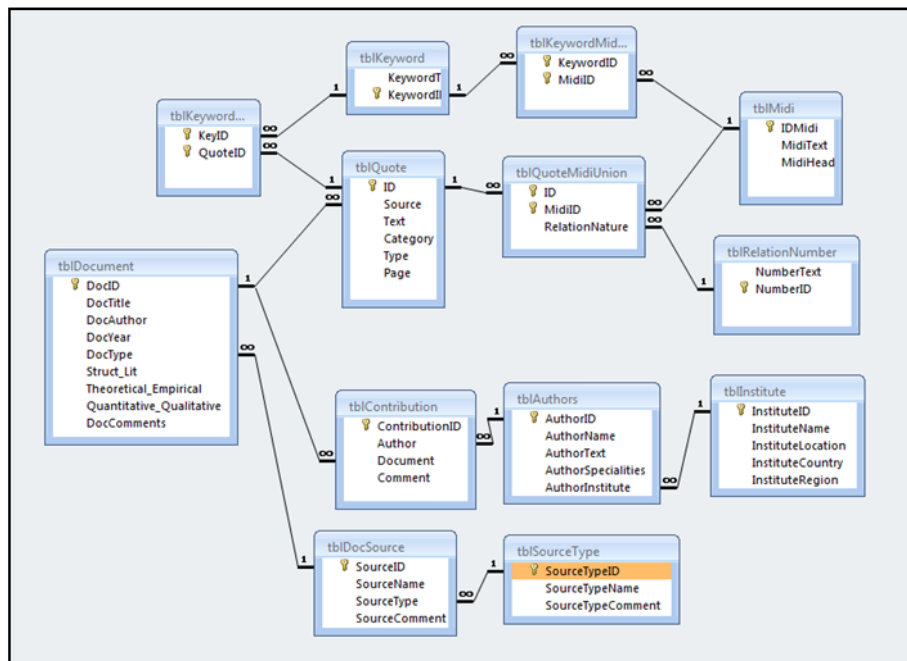
- VERONA, G. & RAVASI, D. 2003. Unbundling dynamic capabilities: An exploratory study of continuous product innovation. *Industrial and Corporate Change*, 12, 577.
- WANG, C. L. & AHMED, P. K. 2007. Dynamic capabilities: A review and research agenda. *International Journal of Management Reviews*, 9, 31-51.
- WEITZMAN, E. A. 2000. Software and Qualitative Research. In: DENZIN, N. K. & LINCOLN, Y. S. (eds.) *Handbook of Qualitative Research*. 2nd ed. London: Sage Publications Inc.
- WERNERFELT, B. 1984. A Resource-Based View of the Firm. *Strategic Management Journal*, 5, 171-180.
- WERNERFELT, B. 1995. Resource Based Strategy in a Stochastic Model. In: MONTGOMERY, C. A. (ed.) *Resource-based and Evolutionary Theories of the Firm: Towards a Synthesis*. Boston: Kluwer Academic Publishers.
- WHEELER, B., C. 2002. NEBIC: A dynamic capabilities theory for assessing Net-enablement. *Information Systems Research*, 13, 125.
- WHETTEN, D. A. 1989. What Constitutes A Theoretical Contribution? *Academy of Management. The Academy of Management Review*, 14, 490.
- WILLIAMS, C. & LEE, S. H. 2009. Exploring the internal and external venturing of large R&D-intensive firms. *R & D Management*, 39, 231.
- WILLIAMSON, O., E. 1999. Strategy research: Governance and competence perspectives. *Strategic Management Journal*, 20, 1087.
- WILLMOTT, R. 2000. Structure, culture and agency: Rejecting the current orthodoxy of organisation theory. In: ACKROYD, S. & FLEETWOOD, S. (eds.) *Realist Perspectives on Management and Organisations*. London: Routledge.
- WILSON, H. & DANIEL, E. 2007. The multi-channel challenge: A dynamic capability approach. *Industrial Marketing Management*, 36, 10.
- WINTER, S. G. 2003. Understanding dynamic capabilities. *Strategic Management Journal*, 24, 991-995.
- WITCHER, B., J. , CHAU, V. S. & HARDING, P. 2008. Dynamic capabilities: top executive audits and hoshin kanri at Nissan South Africa. *International Journal of Operations & Production Management*, 28, 540.
- WONGLIMPIYARAT, J. 2004. Amex's strategies for launching the smart card innovation. *Technovation*, 24, 773.
- WU, L.-Y. 2006. Resources, dynamic capabilities and performance in a dynamic environment: Perceptions in Taiwanese IT enterprises. *Information & Management*, 43, 447.
- WU, L.-Y. 2007. Entrepreneurial resources, dynamic capabilities and start-up performance of Taiwan's high-tech firms. *Journal of Business Research*, 60, 549.
- WU, L. 2010. Applicability of the resource-based and dynamic-capability views under environmental volatility. *Journal of Business Research*, 63, 27.
- YIN, R. K. 2003. *Case Study Research - Design and Methods*, London, Sage.
- ZAHRA, S., A. 1999. The changing rules of global competitiveness in the 21st century. *Academy of Management Executive*, 13, 36.
- ZAHRA, S., A. & GEORGE, G. 2002a. Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review*, 27, 185-203.

- ZAHRA, S., A. & GEORGE, G. 2002b. The Net-enabled business innovation cycle and the evolution of dynamic capabilities. *Information Systems Research*, 13, 147.
- ZAHRA, S., A. , SAPIENZA, H., J. & DAVIDSSON, P. 2006. Entrepreneurship and Dynamic Capabilities: A Review, Model and Research Agenda. *Journal of Management Studies*, 43, 917.
- ZHOU, K. & LI, C. 2010. How strategic orientations influence the building of dynamic capability in emerging economies. *Journal of Business Research*, 63, 224.
- ZHU, K. & KRAEMER, K., L. 2002. e-commerce metrics for Net-enhanced organizations: Assessing the value e-commerce to firm performance in the manufacturing sector. *Information Systems Research*, 13, 275.
- ZOLLO, M. & WINTER, S. G. 2002. Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13, 339-351.
- ZOTT, C. 2003. Dynamic capabilities and the emergence of intraindustry differential firm performance: Insights from a simulation study. *Strategic Management Journal*, 24, 97.
- ZUNIGA-VICENTE, J., A. & VICENTE-LORENTE, J., D. 2006. Strategic Moves and Organizational Survival in Turbulent Environments: The Case of Spanish Banks (1983-97). *Journal of Management Studies*, 43, 485.
- ZYLBERZTAJN, D. & FILHO, C. A. P. M. 2003. Competitiveness of meat agri-food chain in Brazil. *Supply Chain Management*, 8, 155.

Appendices

Please note that a numeric reference system is used when labelling appendices – e.g. for appendix X.Y, X represents the chapter in which the appendix was initially referred to and Y is used to distinguish between appended sections from the same chapter.

Appendix 2.1 Structured Literature Review Database



The above diagram depicts the data fields, tables and relationships in the structured literature review database. Each box represents a data table which holds either direct data from a paper or meta-data about the paper. Unique ID numbers in different tables are used to link data together and as can be seen in the diagram, all tables are connected (i.e. it is possible to follow a link from one table to any other table). Using Access' in-built query and reporting features, it is therefore possible to search based on individual criterion (e.g. show me all dynamic capabilities papers published before 2003) and compound criterion (e.g. show me all dynamic capabilities papers published before 2003 in 3 or 4 star journals by UK based authors adopting a qualitative methodology).

Appendix 2.2 – Dynamic Capabilities Definitions

Selected Definitions of Dynamic Capabilities

Dynamic capabilities are the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments.	(Teece et al, 1997) p516
Dynamic capabilities consist of specific strategic and organisational processes that create value for firms within dynamic markets by manipulating resources into new value-creating strategies.	(Eisenhardt and Martin, 2000) p1106
Dynamic capabilities exist to extend, modify or create ordinary capabilities... Dynamic capabilities contrast with ordinary capabilities by being concerned with change.	(Winter, 2003) pp991-2
Dynamic capabilities describe the abilities to reconfigure a firm's resources and routines in the manner envisioned and deemed appropriate by its principal decision-maker(s)	(Zahra et al, 2006) p918
Dynamic capabilities can be disaggregated into the capacity (1) to sense and shape opportunities and threats, (2) to seize opportunities, and (3) to maintain competitiveness through enhancing, combining, protecting, and, when necessary, reconfiguring the business enterprise's intangible and tangible assets	(Teece, 2007) p1319
Dynamic capabilities emphasize the key role of strategic leadership in appropriately adapting, integrating and reconfiguring organizational skills and resources to match changing environments... The ability of senior managers to seize opportunities through the orchestration and integration of both new and existing assets to overcome inertia and path dependencies is at the core of dynamic capabilities	(O'Reilly III and Tushman, 2008) p185, 187
A dynamic capability is the firm's potential to systematically solve problems, formed by its propensity to sense opportunities and threats, to make timely and market-oriented decisions, and to change its resource base	(Barreto, 2010) p271
A dynamic capability is a learned and stable pattern of collective activity through which the organisation systematically generates and modifies its operating routines in pursuit of improved effectiveness	(Zollo and Winter, 2002) p340
The mechanisms which allow winners to survive	(Lee et al, 2002) p727
Dynamic capabilities are essentially change-oriented capabilities that help firms redeploy and reconfigure their resource base to meet evolving customer demands and competitor strategies.	(Zahra and George, 2002b) p148
Dynamic capabilities enable the "timely and ongoing reconfiguration of firm resources" ... they are "a means to achieving resource configurations that provide advantage, though possibly short term, in the marketplace based on	(Wheeler, 2002) P125, p128

Schumpeterian rents as market opportunities emerge, collide, evolve, and die”	
Dynamic capabilities involve adaption and change because they build, integrate or reconfigure other resources and capabilities	(Helfat and Peteraf, 2003) p997
The dynamic capabilities view (DCV) focuses on the capacity an organization facing a rapidly changing environment has to create new resources, to renew or alter its resource mix. Ie. it addresses the processes of future resource creation	(Bowman and Ambrosini, 2003) p292
Dynamic capabilities are rooted in both exploitative and exploratory activities of an organisation	(Benner and Tushman, 2003) p238
A set of routines guiding the evolution of a firm’s resource configuration	(Zott, 2003) p97
Dynamic capabilities measure the incumbents capacity to modify existing capabilities. The notion of dynamic capabilities indicates whether the incumbents can alter the configuration of its capabilities.	(Lavie, 2006) p153
Dynamic capabilities are defined as a firm's behavioural orientation constantly to integrate, reconfigure, renew and recreate its resources and capabilities and most importantly upgrade and reconstruct its core capabilities in response to the changing environment to attain and sustain competitive advantage.	(Wang and Ahmed, 2007) p35
Organisational level capabilities that may change ordinary capabilities	(Regnér, 2008) p567
‘Dynamic capabilities’ refers to the particular (non-imitable) capacity business enterprises possess to shape, reshape, configure, and reconfigure assets so as to respond to changing technologies and markets and escape the zero profit condition. Dynamic capabilities relate to the enterprise’s ability to sense, seize, and adapt, in order to generate and exploit internal and external enterprise-specific competences, and to address the enterprise’s changing environment	(Augier and Teece, 2008) p1190
are higher level capabilities which provide opportunities for knowledge gathering and sharing, continual updating of the operational processes, interaction with the environment, and decision-making evaluations	(Easterby-Smith et al, 2009) pS7
a dynamic capability is an organizational phenomenon accountable for the creation of novel knowledge that significantly deviates from a firm’s existing knowledge trajectories.	(Pandza and Thorpe, 2009) p119
Dynamic capabilities represent the ability of managers to create innovative responses to a changing business environment	(Macpherson et al, 2004) p162

Appendix 3.1 – Thematic Review of Dynamic Capabilities Empirical Literature

Sources in white- qualitative empirical	Sources in grey – quantitative empirical
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1 -Learning

<p>Theme 1a - If learning is a continuous process, then previous deployments of dynamic capability may yield unintended/organic experiential learning which will influence future deployments</p> <ul style="list-style-type: none"> • Camuffo and Volpato’s (1996) longitudinal study of Fiat suggests that dynamic capabilities are fuelled by organisational learning on-going and how they are deployed will be modified in response to experiential learning • Forrant and Flynn’s (1999) longitudinal case study of Brimfield Precision Inc suggests that learning has to be continuous if a firm is to successfully deploy dynamic capabilities ongoing • Athreye et al’s (2009) longitudinal cross case analysis of 4 pharmaceutical firms suggests that naturally occurring inter-organisational learning will change the way in which dynamic capabilities are deployed
<ul style="list-style-type: none"> • Bhatt and Grover’s (2005) study of IT executives suggests that learning is core to dynamic capabilities development and deployment • Kale and Singh’s (2007) study of alliances suggests that joint learning plays a critical role in the development of relational and shared dynamic capabilities • Sarkis et al’s (2010) study of automotive firms suggests that learning enables the development of environmental management dynamic capabilities
<p>Theme 1b - The deployment of deliberate learning mechanisms may impact how dynamic capabilities are deployed in practice</p> <ul style="list-style-type: none"> • Salvato’s (2003) cross case study of 2 Italian firms suggests that managers use explicit learning mechanisms to build useful experience into productive routines underpinning dynamic capabilities • Pandza et al’s (2003b) longitudinal cross case comparison of manufacturing firms suggests that managers will seek to integrate external and internal learning into capabilities through the deployment of knowledge management dynamic capabilities over time • Blomqvist et al’s (2004) participate case study of Sonera suggests that co-learning with external parties can foster relational dynamic capabilities and managers use their social contacts to enable such an activity • Anand et al’s (2009) cross case study of 5 anonymous organisation suggests that dynamic capabilities can be deployed to deliver continuous improvements when continuous organisational learning processes in parallel drive the customisation and refinement of managerial approach • Salvato’s (2009) longitudinal study of Alessi finds that managers purposefully deploy a range of learning mechanisms to embed experiential learning into extant organisational routines • Kale’s (2010) case study of the Indian pharmaceutical industry suggests that

continual and deliberate learning mechanisms are required to support the deployment of dynamic capabilities and information must flow between the two.

- Bierly and Chakrabarti's (1996) study of ethical pharmaceutical firms suggest that its internal and external learning mechanisms underpin its dynamic capabilities
- Garcia-Morales et al's (2007) study of Spanish firms suggests that learning underpins the development and use of organisational dynamic capabilities.
- Azadegan et al's (2008) study of designers suggests that learning mechanisms tailored to the needs of existing staff will raise the capacity for change of the resource base overall
- Jarratt's (2008) study of UK manufacturing firms finds that learning is central to the development of relational dynamic capabilities
- Karim's (2009) study of the medical industry suggests that learning and unlearning influence an organisation's dynamic capabilities
- Malik and Kotabe's (2009) study of manufacturing firms in emerging markets find that learning mechanisms underpin the development and use of dynamic capabilities

2 - Knowledge Management and Absorptive Capacity

Theme 2a – Knowledge management processes and routines (or absorptive capacity) help to distribute and use knowledge stocks from internal and external sources during the deployment of dynamic capabilities

- Bruni and Verona's (2009) cross-case study of pharmaceutical firms shows that managers codify and distribute market knowledge on a regular basis, creating a common language and enabling the deployment of dynamic capabilities through clear communication.
- Verona and Ravasi's (2003) longitudinal study of Oticon suggests that knowledge management processes are the mechanisms by which dynamic capabilities are deployed
- Macher and Mowery's (2009) study of the semiconductor industry suggests that dynamic capabilities are influenced by knowledge management routines
- Lichtenthaler's (2009) study of Industrial firms proposes that absorptive capacity is a dynamic capability underpinned by processes and routines
- Narasimhan et al's (2006) study of electronics firms with patents suggests that absorptive capacity is a dynamic capability for managing knowledge in turbulent environments
- Sher and Lee's (2003) study of Taiwanese firms proposes that IT is a key enabler of knowledge management processes which facilitates the development and deployment of dynamic capabilities
- Cepeda and Vera's (2007) study of information and communication technology firms finds that knowledge management microprocesses underpin dynamic capabilities use
- Bierly and Chakrabarti's (1996) study of ethical pharmaceutical firms suggest that ongoing knowledge management enables its use of dynamic capabilities

- Sarkis et al's (2010) study of automotive firms suggests that knowledge management processes enable the deployment of environmental management dynamic capabilities

Theme 2b – Internal knowledge stocks are drawn on during the deployment of dynamic capabilities

- Pandza et al's (2003a) Longitudinal retrospective case study in Rolls Royce suggests that over time, a firm can use accumulated knowledge to make strategic resource investment and develop real options.
- Salvato's (2009) longitudinal study of Alessi finds that knowledge embedded in semi-automatic organisational practices influences the deployment of dynamic capabilities
- MacCormack and Iansiti's (2009) historical case study of Microsoft suggests that where knowledge is made widely available internal through modular product architecture but tightly controlled externally through IP enforcement and secrecy, dynamic capabilities can create advantage through novel knowledge combinations
- Iansiti and Clark's (1994) longitudinal cross case analysis of Nissan and NEC suggests that knowledge from internal and external sources drives the deployment of dynamic capabilities

- Helfat's (1997) study of the petroleum industry in the 1970s and 80s suggests that prior know how improves the absorption of new knowledge from R&D activities
- McKelvie and Davidsson (2009) review of Swedish new firms finds that dynamic capabilities are influenced by knowledge embedded in human capital at all levels
- Rothaermal and Hess (2007) study of the pharmaceutical industry finds that individual knowledge can underpin the deployment of dynamic capabilities in pursuit of innovative outputs
- Marsh and Stock's (2006) review of product developers suggests that knowledge retention and reapplication enables dynamic capability deployment in the form of the NPD process
- Garcia-Morales et al's (2007) study of Spanish firms suggests that knowledge in the form of personal mastery has a profound impact on the development and use of organisational dynamic capabilities.

Theme 2c – External knowledge stocks from partner organisations are drawn on when deploying dynamic capabilities

- Newey and Zahra's (2009) cross-case study of NPD in pharmaceutical firms suggests that absorptive capacity enables managers to entrepreneurially experiment through the iterative deployment of dynamic capabilities through the NPD process infused with novel knowledge absorbed from external network partners
- Blomqvist et al's (2004) participate case study of Sonera suggests that managers draw on absorptive capacity to identify appropriate external resources to tap into during dynamic capability deployment
- Petroni's (1998) longitudinal study of Smith and Nephew suggests that

knowledge integration and transformation abilities are central to the deployment of dynamic capabilities – they involve regular ‘sampling’ of the external environment

- Iansiti and Clark’s (1994) longitudinal cross case analysis of Nissan and NEC suggests that knowledge from internal and external sources drives the deployment of dynamic capabilities
- Tripsas’ (1997) longitudinal historical case study of three typesetting firms suggests that dynamic capabilities deployment is grounded in part on the use of the ability to integrate appropriate external knowledge

No empirical papers found

3 – Path Dependence and History

Theme 3 – How dynamic capabilities are deployed is in part determined by resource stocks and capabilities which are the embodiment of previous decisions and deployments of dynamic capabilities

- Wonglimpiyarat’s (2004) study of Amex suggests that the firm’s ability to deploy dynamic capabilities in New Product Development is entrenched in its previous actions
- Lazonick and Prencipe’s (2005) historical longitudinal case study of Rolls Royce suggests that financial commitment and strategic control of resources (both historical considerations) have a huge impact on a firm’s ability to deploy dynamic capabilities
- Harreld et al’s (2007) longitudinal, participative case study of IBM suggests that history has the potential to suffocate the deployment of dynamic capabilities and a collective, conscious decision to break from traditional paths may be required to enable DCs
- Holweg and Pil’s (2008) longitudinal cross case comparison of automotive OEMs suggests that dynamic capabilities are deployed in a highly path dependent manner
- Athreye et al’s (2009) longitudinal cross case analysis of 4 pharmaceutical firms suggests that the firm’s trajectory has a huge bearing on how it deploys dynamic capabilities
- Ellonen et al’s (2009) cross case analysis of 4 publishing firms suggests that the practice of deploying dynamic capabilities in a firm is highly path dependent.
- Townsend et al’s (2010) longitudinal case study of General Motors suggests that history shapes not just the organisational structure of the firm but also the way in which dynamic capabilities are deployed
- King and Tucci’s (2002) study of the disk drive industry suggests that history and experience embodied in capabilities are critical determinants of dynamic capabilities form and function
- Karim’s (2006) study of the medical industry suggests that history directs future experimentation and therefore influences the development/use of dynamic capabilities
- Zuniga-Vicente and Vicente-Lorente’s (2006) study of Spanish banks suggests that the historical accumulation of capabilities has a profound impact on the

dynamic capabilities available to a firm and how they are used.
Theme 3b –Dynamic capabilities may require deployment over a sustained period of time in order to effect certain types of change
<ul style="list-style-type: none"> • Forrant and Flynn’s (1999) longitudinal case study of Brimfield Precision Inc suggests that dynamic capabilities may have to be deployed over years if capabilities rooted in culture are to be adapted. • Galunic and Eisenhardt’s (2001) longitudinal case study in an electronics firm finds that dynamic capabilities are repeatedly deployed over time to effect social/cultural change • Pandza et al’s (2003b) longitudinal cross case comparison of manufacturing firms suggests that dynamic capabilities have to be deployed over (a long period of) time to build capabilities
<ul style="list-style-type: none"> • Chang’s (2003) study of UK and Taiwanese firms finds that the development of relational dynamic capabilities for when they are needed takes forethought and time

4 –Complementarities, Resource Combinations and Capabilities

Theme 4a – Availability of balanced resources for use or combination with other resources influence if and how a firm might deploy dynamic capabilities
<ul style="list-style-type: none"> • Camuffo and Volpato’s (1996) longitudinal study of Fiat suggests that dynamic capabilities emerge from complex combinations of organisational resources, including knowledge, culture and technology among others. • Verona and Ravasi’s (2003) longitudinal study of Oticon suggests that dynamic capabilities deployment are contingent on finding the right mix of actors, culture, resources, structures and systems • Taylor and Helfat’s (2009) historical, longitudinal cross case analysis of IBM and NCR suggests that managers seeking to introduce new technology must seek to build linkages with existing complementary assets for the change to be successful • Williams and Lee’s (2009) study of R&D intensive firms suggests that extant resource and capabilities need constant monitoring and assessment for opportunity to deploy/redeploy through dynamic capabilities
<ul style="list-style-type: none"> • Menguc and Barker’s (2005) study of sales agents suggests that relational dynamic capabilities emerged from the skills of individuals combined with organisational complementary resources • Banker et al’s (2006) review of manufacturing firms finds that complementary assets are required for them to exploit IT resources fully and develop related dynamic capabilities • Azadegan et al’s (2008) study of designers suggests strategic hiring practices (to create balanced human resource pools) can improve the deployment of dynamic capabilities • Fink and Neumann’s (2009) study of IT managers suggests that IT resources and investment is less important than human capital and expertise
Theme 4b – Information technology is a key enabler of dynamic capabilities
<ul style="list-style-type: none"> • Bruni and Verona’s (2009) cross-case study of pharmaceutical firms shows that managers can use various forms of information technology to communicate effectively, efficiently and regularly with staff during the deployment of dynamic

capabilities
<ul style="list-style-type: none"> • Zhu and Kraemer's (2002) survey of manufacturing organisations suggests that firms with dynamic capabilities can better reap benefits from ecommerce through adjusting/configuring IT resources • Sher and Lee's (2003) study of Taiwanese firms proposes that IT is a key enabler of knowledge management which facilitates the development and deployment of dynamic capabilities • Vaidyanathan and Devaraj's (2008) study of procurement managers finds that processes underpinning dynamic capabilities can be better enabled through IT
Theme 4c – Existing capabilities and processes strongly influence how a firm can deploy its dynamic capabilities
<ul style="list-style-type: none"> • O'Connor and DeMartino's (2006) cross case study of 12 multinationals suggests that managers deploying dynamic capabilities regularly draw on extant capabilities in a variety of fields • Butler and Murphy's (2008) study of two small software firms suggests that dynamic capabilities are deployed through a hierarchy of capabilities • Ellonen et al's (2009) cross case analysis of 4 publishing firms suggests that firms need a balanced set of component capabilities in order to deploy dynamic capabilities effectively • Maklan and Knox's (2009) cross case study of 2 anonymous British firms finds that dynamic capabilities deployment is driven by complex combinations of simpler capabilities
<ul style="list-style-type: none"> • Marcus and Anderson's (2006) study of US grocers suggests that the form of dynamic capabilities emerges from complex combinations of capabilities and skills • Narasimhan et al's (2006) study of electronics firms with patents suggests that dynamic capabilities may emerge from complex combinations of extant capabilities • Rothaermal and Hess (2007) study of the pharmaceutical industry finds that complementarities between firm level and network level capabilities can underpin the deployment of dynamic capabilities in pursuit of innovative outputs • Morgan et al's (2009) study of consumer goods firms suggests that complementarities between market orientation and marketing capabilities enhance dynamic capabilities • Fang and Zhou's (2009) review of international joint ventures suggests that suggest that dynamic capabilities are deployed through a combination of R&D, supply chain management and customer relationship management processes

5 – The Physical and Functional Resource of Management

Theme 5a – Availability and use of managerial attention is a key determinant of the firm's ability to deploy dynamic capabilities
<ul style="list-style-type: none"> • Salvato's (2003) cross case study of 2 Italian firms suggests that managerial attention is directed on a very regular basis to dynamic capabilities deployment through microprocesses composed of agential and routine components. • Mathiassen and Vainio's (2007) cross case comparison of two software firms suggests that (a lack of) managerial resource can act as a choke point in the

deployment of dynamic capabilities

- Pablo et al's (2007) longitudinal case study of a public organisation finds that managers deploy dynamic capabilities through the allocation of their own time and energy to guiding resource base change on a daily basis – described as continual management
- Witcher et al's (2007) longitudinal case study of Hoshin Kanri at Nissan suggests that consistent high level managerial activity and involvement is paramount to dynamic capabilities deployment, which in turn develops appropriate organisational resources
- Lee and Kelley's (2008) cross case study of 2 Korean multi-national firms suggests that managers have to provide regular communication, guidance and empowerment to staff during the deployment of dynamic capabilities
- O'Reilly III et al's (2009) longitudinal, participative case study of IBM suggests that strategic use of management resource is at the core of legitimising and directing change

- Danneels' (2008) study of manufacturing firms suggests that managerial slack (and slack resources) are necessary for the deployment of dynamic capabilities

Theme 5b – The management function plays a key role in shaping how dynamic capabilities will be deployed in a firm

- Iansiti and Clark's (1994) longitudinal cross case analysis of Nissan and NEC suggests that managers play a critical integrative and coordinative role relating to knowledge resources in the deployment of dynamic capabilities
- MacPherson et al's (2004) case study of an SME engaging with a large firm shows how management co-ordinates the exchange of knowledge to develop new firm capabilities
- Harreld et al's (2007) longitudinal, participative case study of IBM suggests that managerial resource allocation activity has to be enacted through dynamic capabilities in a timely manner
- Harris et al's (2009) cross case study of software firms suggests that managers deploying dynamic capabilities coordinate and modularise resource allocation to minimise staff exposure to uncertainty whilst provide regular feedback and communication
- Salvato's (2009) longitudinal study of Alessi finds that managers provide the purpose and direction to coordinate capability development over time, using dynamic capabilities representing semi-automatic routines adjusted to fit the circumstances
- Taylor and Helfat's (2009) historical, longitudinal cross case analysis of IBM and NCR suggests that managers must play a coordinative role in the deployment of dynamic capabilities, employing resource allocation and socialisation tools

- Adner and Helfat's (2003) study of the oil industry suggests that different dimensions of management resource influence organisational dynamic capabilities
- Liao et al's (2009) study of internet entrepreneurs suggests that integrative and coordinative capabilities of management are critical to the use of dynamic capabilities
- Sirmon and Hitt's (2009) study of US regional banks suggests that managerial resource allocation and deployment activities underpin dynamic capabilities

6 - Human Aspects of Management – Individuals and Systems

Theme 6a – Characteristics of individual managers – their experience, skills, social capital and mental models – will be significant determinants of how they deploy dynamic capabilities

- D’Adderio’s (2001) participative longitudinal study of product development suggests that managerial capacity to handle competing organisational demands is central to dynamic capability and deployment in practice involves overlapping daily dialectics
- MacPherson et al’s (2004) case study of an SME engaging with a large firm shows how the managers repeatedly act entrepreneurially as knowledge brokers (using dynamic managerial capability) to develop new firm capabilities
- Mathiassen and Vainio’s (2007) cross case comparison of two software firms suggests that entrepreneurial managerial decision making is vital to enabling the rapid appropriate deployment of dynamic capabilities in response to environmental stimuli
- Lee and Kelley’s (2008) cross case study of 2 Korean multi-national firms suggests that managers draw on entrepreneurial cognitive abilities to know what and when to assemble in terms of resource bundles on an ongoing basis
- Carpenter et al’s (2001) study of CEOs with international experience suggests that such managerial human capital provides enhanced organisational dynamic capabilities
- Adner and Helfat’s (2003) study of the oil industry suggests that dynamic managerial capabilities are driven in part by the cognitive frames and associated perceptions of managers
- Kor and Mahoney’s (2005) studies of technological firms that managerial perception driven by experience is a key determinant of dynamic capabilities
- Newbert’s (2005) study of nascent entrepreneurs suggests that new firm formation is a dynamic capability executed at the level of the individual entrepreneur.
- Moliterno and Wiersema’s (2007) study of Major League baseball finds that managerial cognitive abilities have a major impact on dynamic capabilities deployments
- Peteraf and Reed’s (2007) study of managerial discretion under regulation suggests that managerial perception of opportunity can drive dynamic capabilities
- Danneels’ (2008) study of manufacturing firms suggests that managerial perception and choice play a key role in dynamic capabilities development and deployment

Theme 6b – Characteristics of the managerial system – the summative and usable experience, skills, social capital and mental models – will be significant determinants of how dynamic capabilities are deployed throughout an organisation

- Petroni’s (1998) longitudinal study of Smith and Nephew suggests that an aligned managerial system can deploy ‘action producing’ procedures during the deployment of dynamic capabilities.
- Rosenbloom’s (2000) historical, longitudinal case study of NCR suggests that

collectively management has to find new paths for an organisation and as such, it needs to operate as a system

- Rindova and Kotha's (2001) study of internet search engines reveals that entrepreneurial management underpins 'continual morphing' with managers constantly adapting their approach in an opportunistic and entrepreneurial manner
 - Gilbert's (2006) longitudinal case study of a publishing firm suggests that managerial cognitive ability to juggle competing frames is at the core of dynamic capabilities and the practice of dynamic capabilities involves regular switching. Senior leadership have to maintain the alignment of views within the managerial system during deployment
 - O'Connor and DeMartino's (2006) cross case study of 12 multinationals suggests that managers deploying dynamic capabilities have to do so as a collective system, sharing mental models as well procedures and structures
 - Aragon-Correa and Rubio-Lopez's (2007) study of environmental management practices suggests that managerial entrepreneurship can create market opportunities relating to the social practices and perceptions of societal stakeholders
 - Athreye et al's (2009) longitudinal cross case analysis of 4 pharmaceutical firms suggest that the communication of managerial vision is a critical task during long term deployment of dynamic capabilities
 - MacCormack and Iansiti's (2009) historical case study of Microsoft finds that entrepreneurial managerial approaches are required to legitimacy the recombination of internal knowledge resources behind new market opportunities
 - Taylor and Helfat's (2009) historical, longitudinal cross case analysis of IBM and NCR suggests that managers must address rather than endorse organisational cultural rigidities when deploying dynamic capabilities – this is done in a contingent way.
- Garcia-Morales et al's (2007) study of Spanish firms suggests that shared senior managerial perceptions of skills, knowledge and learning have a profound impact on the development and use of organisational dynamic capabilities.
 - Newbert et al's (2008) study of micro and nano-manufacturers found that entrepreneurial management is an essential dynamic capability for SME high-tech manufacturers.

7 - Organisational Culture and Structural Inertia

Theme 7a - Organisational inertia may help the delivery of change to the resource base where change aligns in some way with the manner in which things are currently done

- Pablo et al's (2007) longitudinal case study of public organisation finds that managers deploy dynamic capabilities through developing trust and fostering relationships with staff as an integral part of the social process of change
- Petroni's (1998) longitudinal study of Smith and Nephew suggests that an aligned culture (as in agreeable and accepting of proposed change) makes the deployment of dynamic capabilities more feasible
- King and Tucci's (2002) study of the disk drive industry suggests that routines

embedded in the organisation's culture may enhance rather than inhibit dynamic capabilities

Theme 7b - Where change goes against established organisational norms, managers need to address related structural inertia in a socially intelligent way in order to deliver change

- D'Adderio's (2001) participative longitudinal study of product development suggests that managers have to manage competing internal cultures in a comprehensive way and the practice of dynamic capabilities requires them to engage all participants, creating common channels of communication and shared goals.
 - Galunic and Eisenhardt's (2001) longitudinal case study in an electronics firm finds that dynamic capabilities deployment requires senior managers to carefully manage change interactions with the culture/organisation as a whole based on social logic
 - Buenstorf and Murmann's (2005) historical review of the Zeiss foundation implies that managers must be respectful or at least mindful of existing organisational culture and social processes in the deployment of change routines/dynamic capabilities.
 - Harreld et al's (2007) longitudinal, participative case study of IBM suggests that executive leadership has to legitimise new ways of doing things when it goes against the grain of an organisation and its routines
 - Lee and Kelley's (2008) cross case study of 2 Korean multi-national firms suggests that managers need to invest effort in engaging, empowering and persuading members of the organisation over time to overcome organisational inertia (drawing on relational capabilities)
 - Anand et al's (2009) cross case study of 5 anonymous organisation suggests that dynamic capabilities can be deployed to deliver continuous improvements where the delivery is refined to match the internal context of the organisation
 - Narayanan et al's (2009) case study of a pharmaceutical firm partnership suggests that senior managers are required to negotiate away resistance from the operational organisation when deploying dynamic capabilities in uncertain circumstances
 - Townsend et al's (2010) longitudinal case study of General Motors suggests that organisational structural inertia and culture have to be addressed over time when deploying dynamic capabilities and managers need to do so contingently
- Uhlenbruck's (2004) study of acquisitions of Eastern European firms suggests that organisational culture can be a valuable asset to acquire but that it can be destroyed without socially aware managerial approaches during the deployment of dynamic capabilities
 - Capron and Mitchell's (2009) study of the telecoms market finds that internal culture (and future fit with it of targeted capabilities for development) is an important decision criteria in dynamic capabilities deployment as to which mode to adopt
 - Eggers and Kaplan's (2009) study of the ICT industry suggests that organisational inertia can inhibit the deployment of dynamic capabilities in pursuit of new technologies

8 – Managerial Agency

Theme 8a - Managerial agency relative to the change required impacts the form and legitimacy of deployment of dynamic capabilities

- Rosenbloom's (2000) historical, longitudinal case study of NCR suggests that leadership is central to the legitimacy required to deploy dynamic capabilities – lack of leadership attention will diminish the likelihood of dynamic capabilities being used effectively
 - Butler and Murphy's (2008) study of two small software firms suggests that in small firms, the CEO/owner's personality and leadership style dictate how dynamic capabilities are deployed
 - Holweg and Pil's (2008) longitudinal cross case comparison of automotive OEMs suggests that dynamic capabilities may be deployed without consideration for smaller supply chain partners by a larger OEM for reasons of agency
 - Narayanan et al's (2009) case study of a pharmaceutical firm partnership suggests that senior managers are required to negotiate away resistance from managers where managerial responsibilities were to change as a result of use of dynamic capabilities
 - O'Reilly III et al's (2009) longitudinal, participative case study of IBM suggests that executive leadership is required to unify the management team through the 'change of change' routines
- Carpenter et al's (2001) study of CEOs with international experience suggests that senior manager pay and ability to deliver dynamic capabilities influences pay (and vice versa)
 - Menguc and Barker's (2005) study of sales agents finds that those with stronger relational dynamic capabilities sold more product, generated more income and commanded higher salaries (a greater allocation of rent)
 - Moliterno and Wiersema's (2007) study of Major League baseball finds that employee bargaining power impacts on dynamic capabilities deployments
 - Eggers and Kaplan's (2009) study of the ICT industry suggests that senior managerial perceptions and biases are fundamental determinants of the deployment of dynamic capabilities in the face of new technology
 - Skilton's (2009) study of Hollywood suggests that bargaining power between buyers and suppliers has a major impact on how dynamic capabilities will be deployed in a supply chain

Theme 8b - Managerial agency can act to the benefit of the organisation

- Rindova and Kotha's (2001) study of internet search engines suggests that senior managers creatively adapt their dynamic capability deployment practices whilst bridging organisational structures and approaches
- Salvato's (2003) cross case study of 2 Italian firms suggests that managerial agency is central to the contingent deployment of dynamic capabilities, fitting local decision making into the wider organisational schema
- Salvato's (2009) longitudinal study of Alessi finds that managerial agency is essential to the intelligent and appropriate deployment of dynamic capabilities- managers read situations and respond by altering their approach to making organisational change
- Foss' (2003) longitudinal, reflective case study of Oticon suggests that management control is required in the deployment of dynamic capabilities to

prevent self-serving agential actions taking hold.

- Menguc and Barker's (2005) study of sales agents finds that those with stronger relational dynamic capabilities sold more product, generated more income and commanded higher salaries (a greater allocation of rent)
- Peteraf and Reed's (2007) study of managerial discretion under regulation suggests that managerial agency is critical to adaptation of the organisation
- Benner's (2009) review of the photographic devices industry suggests that senior managerial agency is key to successfully navigating through a turbulent environment.

9 –Routines

Theme 9a – Dynamic capabilities have a routine component which makes them repeatable and can be beneficial in increasing the efficiency of deployment

- D'Adderio's (2001) participative longitudinal study of product development suggests that routines can be used to support the change process once appropriate ways of operating have been identified through experimentation
 - Salvato's (2003) cross case study of 2 Italian firms suggests that routines are an important element of dynamic capabilities deployment which managers draw as part of a range of resources to effect contingent change to the resource base
 - O'Connor and DeMartino's (2006) cross case study of 12 multinationals suggests that managers deploying dynamic capabilities have to abide by the routines and protocols of a system whilst using creativity and intelligence to perform their coordinative role.
 - Witcher et al's (2007) longitudinal case study of Hoshin Kanri at Nissan supports the view that managers can adopt a systematic, routinised approach to deploying dynamic capabilities and still introduce a performative element to suit local needs
 - Anand et al's (2009) cross case study of 5 anonymous organisation suggests that dynamic capabilities can be deployed to deliver continuous improvements in a highly routinised way
 - Narayanan et al's (2009) case study of a pharmaceutical firm partnership suggests that managerial and senior managerial work can be routine.
 - O'Reilly III et al's (2009) longitudinal, participative case study of IBM suggests that dynamic capabilities have to be routinised in order to be repeatable and useful in a corporate context
- King and Tucci's (2002) study of the disk drive industry suggests that routines are a key influencer of dynamic capabilities
 - Lampel and Shamsie's (2003) study of Hollywood suggests that routines underpin dynamic capabilities
 - Newbert's (2005) study of nascent entrepreneurs suggests that ostensibly the process followed in setting up a business is the same but that performatively it will vary according to individual experience and environmental conditions
 - Benner's (2009) review of the photographic devices industry suggests that process improvement routines may inhibit dynamic capabilities in turbulent environments and enhance them when incremental change is required
 - Lopez-Meilgo et al's (2009) study of Spanish firms suggests that innovation management and total quality management processes are dynamic capabilities in both the routinised aspects (hard) and performative (soft) aspects.

Theme 9b – Dynamic capabilities have a performative component grounded in agency which makes them flexible and adaptable to particular circumstances

- Mosey's (2005) longitudinal cross case analysis of 5 engineering manufacturing firms suggests that ostensibly similar dynamic capabilities will be performed very differently between firms and dynamic capabilities can be considered equifinal processes
- O'Connor and DeMartino's (2006) cross case study of 12 multinationals suggests that managers deploying dynamic capabilities have to abide by the routines and protocols of a system whilst using creativity and intelligence to perform their coordinative role.
- Witcher et al's (2007) longitudinal case study of Hoshin Kanri at Nissan supports the view that managers can adopt a systematic, routinised approach to deploying dynamic capabilities and still introduce a performative element to suit local needs of a situation
- Salvato's (2009) longitudinal study of Alessi finds that managers purposefully aim to routinise useful experiences and approaches over time in their dynamic capabilities, which are deployed through using extant semi-automatic routines as the starting point
- Newbert's (2005) study of nascent entrepreneurs suggests that ostensibly the process followed in setting up a business is the same but that performatively it will vary according to individual experience and environmental conditions
- Lopez-Mielgo et al's (2009) study of Spanish firms suggests that innovation management and total quality management processes are dynamic capabilities in both the routinised aspects (hard) and performative (soft) aspects.

10 – Business Environment and Market Conditions

Theme 10a – Environmental scanning mechanisms are essential parts of dynamic capabilities ability to align with the environment or create market change

- Harreld et al's (2007) longitudinal, participative case study of IBM suggests that scanning processes are critical foundations of dynamic capabilities, constantly feeding information to managers in order to make appropriate resource allocation decisions
- Danneels' (2008) study of manufacturing firms suggests that environmental scanning routines are a critical antecedent of dynamic capabilities
- Pierce's (2009) review of the car leasing market suggests that superior forecasting abilities can underpin the dynamic capabilities of a firm

Theme 10b – Firms must be able to respond to changes in external factors

- Rosenbloom's (2000) historical, longitudinal case study of NCR suggests that market turbulence in terms of a wide range of industry factors has to be addressed through dynamic capabilities over the period of an organisation's life.
- Aragon-Correa and Rubio-Lopez's (2007) study of environmental management practices suggest that dynamic capabilities which promote environmental practices in line with societal concerns may generate business opportunities
- Pablo et al's (2007) longitudinal case study of a public organisation finds that managers use learning by experimentation to align the organisation with its

market environment
<ul style="list-style-type: none"> • Narasimhan et al's (2006) study of electronics firms with patents suggests that the dynamic capabilities are necessary for managing knowledge in a turbulent market • Wu's (2006, 2007, 2010) studies of Taiwanese firms suggests that dynamic capabilities will be deployed to build resources in a turbulent environment • Ettlire and Pavlou's (2009) review of collaborative R&D in the automotive industry suggests that technological context has an impact on the use of dynamic capabilities • Sirmon and Hitt's (2009) study of US regional banks suggests that dynamic managerial capabilities can aid alignment of resource deployment decisions with the context of environmental conditions (particularly customer needs and competitor activities)
Theme 10c – Environmental conditions may determine if and how dynamic capabilities are deployed
<ul style="list-style-type: none"> • Athreye's (2005) study of software firms suggests that regulatory change in the environment can drive the deployment of dynamic capabilities • Wilson and Daniel's (2006) cross case, cross sector study of 4 firms suggests that market change velocity can represent a boundary conditions for the use of dynamic capabilities of a particular form • Athreye et al's (2009) longitudinal cross case analysis of 4 pharmaceutical firms suggests that regulatory change in the environment may encourage the deployment of dynamic capabilities
<ul style="list-style-type: none"> • Pavlou and El Sawy's (2006) review of NPD managers finds that dynamic capabilities deployment becomes more valuable in more turbulent environments • Wu's (2006, 2007, 2010) studies of Taiwanese firms suggests that dynamic capabilities will be deployed to build resources in a turbulent environment • Moliterno and Wiersema's (2007) study of Major League baseball finds that market conditions can impacts on dynamic capabilities deployment in pursuit of rent • Peteraf and Reed's (2007) study of managerial discretion under regulation suggests that managers will be able to find ways to maximise the business situation regardless of environmental effects • Fang and Zhou's (2009) review of international joint ventures suggests that suggest that the processes contributing to dynamic capabilities are moderated by market conditions • Pierce's (2009) review of the car leasing market suggests that discontinuous environmental conditions can make dynamic capabilities essential to firm survival • Shamsie et al's (2009) study of Hollywood suggests that market conditions impact the development and usefulness of dynamic capabilities

11 – Business Architecture and Governance

Theme 11a - Business architecture and governance has a major impact on how dynamic capabilities are deployed
<ul style="list-style-type: none"> • Tripsas' (1997) longitudinal historical case study of three typesetting firms

<p>suggests that distributed geography of R&D can drive effect dynamic capabilities development and deployment</p> <ul style="list-style-type: none"> • Galunic and Eisenhardt's (2001) longitudinal case study in an electronics firm finds that dynamic capabilities are used to gradually shift the organisational architecture in an evolutionary fashion (i.e. through a series of small shifts) • Rindova and Kotha's (2001) study of internet search engines reveals how organisational form is modified continuously by a process of continual morphing which enables exploitation whilst exploring and is underpinned by a decentralised structure • Foss' (2003) longitudinal, reflective case study of Oticon suggests that hybrid organisational forms allow managers to exercise their judgement whilst allocating appropriate levels of responsibility to operational staff to maximise ongoing performance • Gilbert's (2006) longitudinal case study of a publishing firm suggests structural differentiation is essential for business level deployment of dynamic capabilities and is a key initial activity; thereafter, managers need to establish appropriate structural links • Harreld et al's (2007) longitudinal, participative case study of IBM suggests that organisational structure and managerial responsibility can be redesigned to enable the effective deployment of dynamic capabilities • Mathiassen and Vainio's (2007) cross case comparison of two software firms suggests that a decentralised structure flows decision making to where it can be made most efficiently during the deployment of dynamic capabilities
<ul style="list-style-type: none"> • Luo's (2003) review of subsidiaries operating in China suggests that local management is critical to the development of dynamic capabilities in MNE subsidiaries • Karim's (2006,2009) studies of the medical industry suggests that business structure/architecture has a key influence on its dynamic capabilities
<p>Theme 11b - Organisational forms which take in external network resources change how dynamic capabilities are used</p>
<ul style="list-style-type: none"> • Smart et al's (2007) case studies of biopharmaceutical firms shows that managers can use dynamic capabilities to share and tap into resources held between firms in novel network configurations and alliances
<ul style="list-style-type: none"> • Lampel and Shamsie's (2003) study of Hollywood suggests that organisational form, particularly relating to network orientation influences dynamic capabilities • Song et al's (2005) study of joint ventures in turbulent markets finds that joint ventures can aid the development of technological and marketing dynamic capabilities • Newbert et al's (2008) study of micro and nano-manufacturers found that network form organisational structure/orientation is critical to their existence • Sawyer et al's (2008) study of large firm to SME partnerships found that governance modes were critical to protecting SME partners whilst maximising returns to the partnership, as enabled by relational dynamic capabilities
<p>Theme 11c - Organisational forms and governance have to enable balance of the exploitation/exploration duality</p>
<ul style="list-style-type: none"> • Verona and Ravasi's (2003) longitudinal study of Oticon suggests that loosely coupling resources is essential to the deployment of dynamic capabilities in the

- creation of new options for a firm whilst exploiting what they currently have
- O'Reilly III et al's (2009) longitudinal, participative case study of IBM suggests that segregating resources where dynamic capabilities can be deployed can simultaneously allow the exploitation of other resources through operational capabilities.
 - Salvato's (2009) longitudinal study of Alessi finds that managers enabled simultaneous exploitation and exploration by empowering operational teams to exploit extant capabilities whilst charging managers with developing new approaches
 - Capron and Mitchell's (2009) study of the telecoms industry suggests that firms need to balance the use of internal capability building and external alliancing dynamic capabilities

12 – General Business Context

Theme 12a - Dynamic capabilities have a role to play in managing the contingent fit/alignment of internal organisational and external factors
<ul style="list-style-type: none"> • George's (2005) study of a IP research institute suggests that the deployment of dynamic capabilities has to be determined by context • Mosey's (2005) longitudinal cross case analysis of 5 engineering manufacturing firms suggests that dynamic capabilities must be deployed contingently to match the particular internal and external contexts of the firm. • Aragon-Correa and Rubio-Lopez's (2007) study of environmental management practices suggests that the deployment of dynamic capabilities to develop environmental management practices must be tailored to fit the internal and external context of the organisation • Pablo et al's (2007) longitudinal case study of a public organisation finds that managers have to constantly adapt their approach to dynamic capability deployment in order to align with changing organisational and environmental circumstances • Townsend et al's (2010) longitudinal case study of General Motors suggests that for a large firm, local contexts have to be managed in a dual way by managers deploying dynamic capabilities so that corporate goals are met and local needs are satisfied • Maklan and Knox's (2009) cross case study of 2 anonymous British firms finds that the manner in which dynamic capabilities are deployed varies according to the internal and external context of the organisation, and that dynamic capabilities help steer the alignment of internal and external factors
<ul style="list-style-type: none"> • Griffith and Harvey's (2001) study of market researchers finds that dynamic capabilities are deployed to achieve a fit between the organisation and the locality in which it operates and also between internal resource configurations and market opportunities • Luo's (2003) review of subsidiaries operating in China suggests that institutional pressures and corporate context can jointly shape a firm's dynamic capabilities • Slater et al's (2006) study of senior managers finds that strategic fit with the external and internal contexts of a firm is a key consideration in the deployment

of dynamic capabilities

- Floricel and Ibanescu's (2008) study of R&D managers finds that dynamic capabilities can be deployed to manage a firm's portfolio of innovations in line with its context
- Laeequddin et al's (2009) study of managers in the packaged food industry found that relational dynamic capabilities delivering trust can help the firm adjust to different contexts
- Zhou and Li's (2010) study of Chinese strategic business units suggests that dynamic capabilities deployment is enabled by strategic orientation aligned with context

Theme 12b - Institutional factors can impact the deployment of dynamic capabilities

- Salvato's (2003) cross case study of 2 Italian firms suggests that the deployment of dynamic capabilities will depend very much on the context of the firm at the time of deployment
- George's (2005) study of a IP research institute suggests that the deployment of dynamic capabilities has to be determined by context
- Townsend et al's (2010) longitudinal case study of General Motors suggests that for a large firm, local contexts have to be managed in a dual way by managers deploying dynamic capabilities so that corporate goals are met and local needs are satisfied

- Lampel and Shamsie's (2003) study of Hollywood suggests that the external/institutional context in the form of shared industry capabilities can have a huge impact on the value and use of dynamic capabilities
- Luo's (2003) review of subsidiaries operating in China suggests that institutional pressures and corporate context can jointly shape a firm's dynamic capabilities
- Marcus and Anderson's (2006) study of US grocers suggests that the form of dynamic capabilities and how they are used are in part determined by stakeholder pressures
- Benner's (2009) review of the photographic devices industry suggests that institutional pressures to adopt process improvement routines may inhibit dynamic capabilities
- Malik and Kotabe's (2009) study of manufacturing firms in emerging markets find that institutional factors can positively and negatively impact dynamic capabilities
- Sarkis et al's (2010) study of automotive firms suggests that institutional pressures can drive the development of environmental management dynamic capabilities

13 – Social Capital and Network Positions

Theme 13a - Social capital/relational capabilities enable managers to attract and utilise external resources during the deployment of dynamic capabilities

- Pandza et al's (2003a) Longitudinal retrospective case study in Rolls Royce suggests managers will be able to tap into network resources as a set of virtual real options which provides a mechanism for dealing with environmental uncertainty and risk

- Blomqvist et al's (2004) participate case study of Sonera suggests that managers deploying dynamic capabilities are increasingly drawing on resources and knowledge from external partners, and rapid decision making and relations with external parties enable such activities
- Newey and Zahra's (2009) cross-case study of NPD in pharmaceutical firms suggests that network ties can provide knowledge that fuels the deployment of dynamic capabilities

- Wu's (2006) study of Taiwanese firms suggests that dynamic capabilities deployment can increase the attractiveness and social capital of a firm to others seeking alliances
- Rothaermal and Hess (2007) study of the pharmaceutical industry finds that relational network capabilities can underpin the deployment of dynamic capabilities in pursuit of innovative outputs
- Newbert et al's (2008) study of micro and nano-manufacturers found that relational dynamic capabilities and network membership is critical for SMEs
- Vaidyanathan and Devaraj's (2008) study of procurement managers finds that improved supplier relationships fosters better processes underpinning dynamic capabilities
- Aggarwal and Selen's (2009) study of service innovation shows that relational capability underpins the deployment of dynamic capabilities
- Ettl and Pavlou's (2009) review of collaborative R&D in the automotive industry suggests that relational capabilities are critical to successful new product creation

Theme 13b - Firms need to invest time and energy in developing relationships/network positions in order to exploit external resources when needed

- Madhok and Osegowitsch's (2000) qualitative analysis of collaboration suggests that managers can use joint ventures to access cross-border knowledge
- Chang's (2003) study of UK and Taiwanese firms finds that firms can develop relational dynamic capabilities through long term collaboration with institutes and other firms
- Jarratt's (2008) study of UK manufacturing firms finds that long term approaches grounded in learning are central to the development of relational dynamic capabilities
- Laeequddin et al's (2009) study of managers in the packaged food industry found that use of dynamic capabilities can bolster social capital and attract partners for alliancing

Appendix 4.1 Intensive vs Extensive Research Designs

	Intensive	Extensive
Research Question	How does a process work in a particular case or small number of cases? What produces a certain change? What did the agents actually do?	What are the regularities, common patterns, distinguishing features of a population? How widely are certain characteristics or processes distributed or represented?
Relations	Substantial relations of connection	Formal relations of similarity
Type of groups studied	Causal groups	Taxonomic groups
Type of account produced	Causal explanation of the production of certain objects or events, though not necessarily representative ones	Descriptive 'representative' generalisations, lacking in explanatory penetration
Typical methods	Study of individual agents/events in their causal contexts, interactive interviews, ethnography, qualitative analysis	Large scale survey of population or representative sample, formal questionnaires, standardised interviews, statistical analysis
Limitations	Actual concrete patterns and contingent relations are unlikely to be representative, average or generalisable. Necessary relations discovered will exist wherever their relata are present, for example, causal powers of objects are generalisable to other contexts as they are necessary features of these objects	Although representative of a whole population, they are unlikely to be generalisable to other populations at different times and places. Problem of ecological fallacy in making inferences about individuals. Limited explanatory power
Appropriate Tests	Corroboration	Replication

From Sayer (2000) p21

Appendix 4.2 – Quasi-statistical coding guide

Criteria	Description	Option	Description
Change Type	The type of change being made to the resource base	ADD	Increase the stock of a particular resource in the business
		DELETE	Eliminate the stock of a particular resource from the business
		MODIFY	Reconfigure resources without necessarily expanding the scope of their application
		EXTEND	Expand the scope of application of resources without necessarily modifying their configuration
Success	Was the intended outcome achieved as intended and in the intended timescale?	YES	The resource “change” (as above) target objective was met in a way which satisfied the initial purpose/intent in both scale, scope and timescale
		NO	The resource “change” (as above) failed to be delivered in a way which satisfied the initial purpose/intent in both scale, scope and timescale
Energy	How involved were top management in delivering the change	HIGH	Top management were actively involved in making the change, either leading the delivery themselves or taking an active, enacting, lead role in delivery by a group (any size, 2 or more people)
		LOW	Top management were not actively involved in making the change, either fully devolving enactment or taking a supporting, passive role in delivery by a group (any size, 2 or more people) led by

Criteria	Description	Option	Description
			another individual
Engagement	What style of engagement did top management adopt in delivering the change	HIGH	Top management adopted a highly interactive style throughout the change event, communicating frequently between initiation and conclusion with enacting and affected individuals in the organisation
		LOW	Top management adopted a style characterised by lack of interaction with those enacting or affected by the change in the organisation; communicating infrequently between initiation and conclusion.
Approach	How are the managerial processes used during deployment composed?	ROUTINE BIASED	There is a heavy leaning towards the use of approaches which have been observed or described as being used before; agency is minimal.
		NON-ROUTINE BIASED	There is a heavy leaning towards the creation of novel approaches and routine aspects are minimised.
		BALANCED	There is balance between the reapplication of previously successful approaches and a contingent adjustment of the approach to suit the circumstance... effectively a semi-automatic approach
Clarity of Outcome	At the commencement of the change, how clear was the target outcome to all affected?	HIGH	The target outcomes of the intended change were clear at the outset to all involved – expressed in terms of specific, measurable and time-based objectives. All involved clear as to when the outcome is delivered.

Criteria	Description	Option	Description
		LOW	The target outcomes of the intended change lacking in specific, measurable and time based objectives – subjective in at least one of this dimensions. As a result, difference in opinions of affected individuals as to what is required to deliver the change.
Structure	Which organisational grouping is interacted with to deliver the resource base change?	EXTERNAL	An organisation external to the boundaries of the firm is principally engaged with to enact the resource base change
		MANAGERIAL	The managerial team in the organisation is the principal group engaged with to enact the resource base change
		OPERATIONAL	Operational staff in the organisation are the principal group engaged with to enact the resource base change
		ALL INT	All staff in the organisation, at managerial and operational level are engaged in/affected by the proposed change.
Structure View	How does the structure implicitly or explicitly consider the proposed change?	FOR	The affected structure (as above) views the change positively and is a proponent of its execution. This view is expressed either explicitly by those affected or implicitly through actions consistent with the norms/routines of the affected structure
		AGAINST	The affected structure (as above) views the change negatively and is an opponent of its execution. This view is expressed either explicitly by those affected or implicitly

Criteria	Description	Option	Description
			through actions consistent with the norms/routines of the affected structure
		AGNOSTIC	The affected structure (as above) is ambivalent to the proposed change, either perceiving it as irrelevant to its norms/routines or lacking in information/experience to consider it as a threat or benefit.

Appendix 4.3 – Visual Indicators Criteria

The visual indicators deployed in this thesis use a colour to provide a conditional comment about the contents of a cell within a table. The format of the visual indicator is determined by the value of the entry in the cell against action limits. Each table is accompanied by a legend indicating the appropriate action limits. The approach to setting the limits is described below.

Tables indicating regularity of occurrence

These action limits are determined by the number of coding options available. The extract of a table with visual indicators is used as the basis for an explanation of how these aspects work together.

		STRUCTURE				
		EXTERNAL	MANAGERIAL	OPERATIONAL	ALL INT	
RESOURCE TYPE	TANGIBLE	→ 45%	→ 26%	→ 33%	→ 21%	} 3 coding options
	INTANGIBLE	→ 38%	→ 18%	→ 33%	→ 26%	
	HUMAN	→ 17%	↑ 56%	→ 33%	↑ 53%	
CHANGE TYPE	ADD	↑ 55%	↑ 44%	→ 20%	→ 32%	} 4 coding options
	DELETE	↓ 0%	↓ 3%	↓ 7%	↓ 0%	
	MODIFY	→ 31%	→ 33%	↑ 67%	→ 37%	
	EXTEND	→ 14%	→ 21%	↓ 7%	→ 32%	
CLARITY	HIGH	→ 59%	→ 41%	→ 47%	↓ 16%	} 2 coding options
	LOW	→ 41%	→ 59%	→ 53%	↑ 84%	
NT	HIGH	↑ 76%	→ 51%	→ 43%	→ 47%	

Action limits are set by first dividing 1 by the number of coding options to establish the % value that each option would have if they all were equal. For example, in the first category – Resource type – there are three coding options and if the different type of structures were associated equally with each resource type, they each would have a value of $1/3 = 33.3\%$ in the table. To give a quick indication as to how far the different possible combinations are from this baseline level, an action limit is set at

+/- 50% of the baseline level. So continuing this example, $33.3/2 = 16.67$. Therefore the upper action limit is a value of $33.3\% + 16.67\% = 50\%$ (above which the cell will turn green) and the lower action limit is $33.3 - 16.67\% = 16.67\%$ (below which the cell will turn red). Anything between action limits remains yellow.

As the number of options varies, so do the action limits as described in the table below but also as can be seen from the example

Number of options	Baseline Value	Upper Limit	Lower Limit
2	50%	75%	25%
3	33%	50%	16.67%
4	25%	37.5%	12.5%

The extract above also illustrates a limitation of visual indicators in that the intersection of 'External' structure and 'human' resource, at 17%, is only 0.33% away from a different indicator colour – it is not an exact science and a high level of tolerance has to be considered inherent to the approach.

Where indicating rate of success

Where the table indicates a rate of success, a simple linear indication convention is used where:-

<=33% - Low Success Rate
33-67% - Medium Success Rate
>=67% - High Success Rate

Appendix 5.2 – AGS Case Study Narrative

Case 1a – Arrange KTP programme		Achieved?
Outcomes	Obtain funded knowledge transfer partnership	Yes
Tangible	Arrangement of government funding to subsidise KTP associate	Yes
Intangible	Establish relationship with local University	Yes
Human	Recruit additional business resource	Yes
	Access to academic and practitioner know how	Yes
<p>The option of a KTP programme to resource the business systems upgrade project was proposed through an established relationship between the MD and Scottish Enterprise. This led to a meeting between the MD and a representative from the KTP centre, a private group administering programmes on behalf of the government and subsequently an introduction was made to the author. Several meetings were held to identify adequate grounds for a KTP application of mutual benefit. A successful application was lodged in October 2008, securing the required funding for the business and locking in a contractual arrangement for 2 years collaborative research on commencement of hiring a research associate. Newspaper advertising identified a suitable candidate who started in Jan 09.</p>		

Case 1b – Build organisational knowledge of system options		Achieved?
Outcomes	Develop organisational ERP system knowledge t	Yes
Tangible	Arrangement of funding to facilitate academic time	Yes
Intangible	Embed relationship between University and AGS	Yes
Human	Specific knowledge for the MD to facilitate decision making	Yes
<p>In the process of drafting the KTP application (in case 1a), the MD highlighted that a pre-arranged government subsidy for a business system would expire on the 31st March 2009 and he was concerned that the proposed KTP timings would not allow</p>		

him to place an order by such a time, thus forfeiting the funds. To speed up the process, the author suggested tapping into a recently established seed fund in the University of Strathclyde called the Links Project (headed by an ex-colleague of the author). A successful application was lodged to pay for a week of the academic's time to assess internal business system requirements at AGS (incorporating outputs of within case 8a, described later) and provide appropriate guidance on market options. This was duly completed in early September 2008, and a presentation, report and submitted to the MD. Thereafter a series of vendor assessments, site visits and follow up discussions. In December, a decision was made by the MD that the EFACS system, as supplied by RAD software in Kirkintilloch appeared to be the best option for the organisation.

Case 1c – EFACS purchase and install		Achieved?
Outcomes	Obtain EFACS software and supporting hardware	Yes
Tangible	Acquire EFACS Software and Hardware	Yes
	Arrange further project funding	Yes
Intangible	-	-
Human	Develop know how of system architecture in AGS	Yes
<p>Upon identifying the target system in December, the MD invited RAD software into AGS for demonstrations to staff (delivered to management, administrative and operational employees). Over the course of January and February 2009, the KTP project team (the MD, the academic and the hired graduate) analysed the needs of the business from the outputs of (1b), (8a) and material provided by RAD to identify the detailed requirements of the organisation in the form of software modules requiring purchase from the EFACS suite. A detailed list was then incorporated into the contract signed with RAD in late March. From January to March, the MD also arranged further financing for the project through a Scottish Enterprise IT grant. The MD also negotiated with the vendors to reduce system, consultancy and maintenance rates of up to a third on list price. After the signing of the contract, the system components were ordered and installed at AGS early May.</p>		

Case 1d – EFACS organisational upskilling		Achieved?
Outcomes	Instil into the organisation the requisite skills to use EFACS prior to planned cut over.	No
Tangible	Training Media customised to AGS’ needs	No
Intangible	-	-
Human	Organisational know how of EFACS	No

After installation of the required hardware and the selected EFACS modules, a programme of training and development was undertaken by RAD against a pre-agreed plan at a rate negotiated by the MD. Initially, this involved training selected staff in system administrator duties/tasks. Thereafter a programme of training was executed with remaining staff, targeting completion of approximately 15 day long sessions by the end of June 2009 to allow for a July launch of the system. Two factors intervened. Firstly, training was frequently poorly attended with relevant attendees not turning up but facing no consequences for such actions. Secondly, near the end of June, the business secured a number of significant orders which would take it beyond maximum production and administrative capacity over the summer months (see within case 7c), requiring renegotiation of holiday times etc. In the context of such a busy period for the organisation, the decision was taken to postpone the launch of EFACS until October 2009. Later in the summer, the organisation won further orders which continued the maximum capacity situation until the end of November 2009. Furthermore, the lead project resource, the project associate (KTP terminology for the hired graduate) was on holiday for the entire December 2009. Therefore, a decision was taken in September 2009 to postpone EFACS launch training until January 2010.

Case 1e – EFACS configuration		Achieved?
Outcomes	Configure the EFACS system prior to launch to integrate the required business processes for order fulfilment	No
Tangible	-	-
Intangible	Software systems reflect business processes	No
Human	-	-

To enable EFACS prior to launch, the software needed configured from the out the box set-up to a configuration representative of the needs and order fulfilment processes of AGS. This was initiated after the associate had received his administrator training. Several issues quickly emerged. Firstly, the business equivalent of a “unit of analysis” was quickly disputed between departments, in that different parties wanted the data in the system to be configured in different ways. According to the output of (8a), all departments worked along similar lines. The act of engaging them to initiate a configuration showed they weren’t. Also, an integral element of an ERP operations module is the planning logic – this proved to be a significant bone of contention and unresolved between departments. At several managerial meetings in August – November, the production manager (operating a forward looking batching system to set dates) and the contracts manager (working back from a client set ‘drop dead date’) came to loggerheads. The resultant conflicts meant that configuration dates were missed for both the July and then the revised October dates – it was agreed at a management meeting in November that a clean start, disregarding previous documentation, was required in January with the associate to build up the configuration from first principles.

Case 1f – Communications Link		Achieved?
Outcomes	Upgrade communications link between units 14 and 18 to 100 Mbps connection	No
Tangible	High speed communications link between all departments	No
Intangible	-	-
Human	-	-

EFACS is effectively a large database system built on a web platform – users at terminals in any department interface with it through a web connection to share and retrieve data. When EFACS installation was undertaken, it was discovered that between the production unit 18 and the administrative unit 14, there existed only a 0.5 Mbps connection – for years, the production unit had effectively run as an information silo. As the EFACS server was to be held in Unit 14, this would create serious usability issues for anyone in production. A solution was specified by an external

vendor to install a wireless links between the units running at 100Mbps. At the same time, the funding body for KTP announced a £5K refund on the monies paid by AGS to date. As this would pay for the communications upgrade, the link was not commissioned until the refund money was received. However, the refund money was not made available until November, at which time the order book for AGS for December and January meant that conserving cash was a key priority for the organisation. As such, the communications link was not ordered.

Case 2a– Sub contract manufacture quality enhancement		Achieved?
Outcome	Improve sub contract quality output	Yes
Tangible	Revised sub-contract production equipment	Yes
Intangible	Enhance relationship with sub-contract manufacturer	Yes
Human	Enhance quality management skills of sub-contract staff	Yes
<p>After several weeks of sub-contract manufacture, quality issues were identified on-site with wrong component sizes, finishes and performance standards having been applied. Given the risk to AGS’ reputation that these issues presented, the MD personally intervened, harnessing the quality systems knowledge of the associate (gained in a previous role).The MD and the associate spent a number of sessions at the sub-contract facility, root causing production issues (resulting in the usage of different pieces of equipment in manufacture of AGS components). They recorded evidence in the form of videos and photos as to why the issues had happened and presented these back to the sub-contract manufacturer as a codified reminder of how to prevent them reoccurring. This intervention was welcomed by the sub-contract manufacturer and the on-site issues were resolved or contained ongoing.</p>		

Case 2b – AGS Roadshow to Suppliers		Achieved?
Outcome	Build supplier understanding of AGS trajectory and increase the positive perception of AGS as a future partner	Yes
Tangible	Review Material	Yes
Intangible	Reputation and relationship enhancement with suppliers	Yes
Human	Collaborative engagement between departments	Yes

	Empowered management team	Yes
<p>At a management meeting in August 09, a proposal was made to develop interactive workshops as a promotional tool for AGS. The contracts manager recalled doing workshops with suppliers in a previous multi-national company, suggesting that AGS doing so would be very useful to (a) appear to act like a big company (b) engage the suppliers in a dialogue and understand their point of view (c) set the platform to discuss cost reductions with them by explaining the wider economic circumstances (of which they might not be aware). The management team unanimously agreed that this was a good idea and a format and actions to initiate were agreed within 15 minutes. An external venue was selected – the executive suites at Hampden (Scotland’s National Football Stadium) – to impress a certain image on those that were attending. The associate was seconded from the EFACS project to prepare an integrated presentation and the full management team, including the author, agreed to present. The event initially focussed on suppliers – rather than clients – to test the format. The event ran from 4pm – 6pm and was fully attended by the 12 suppliers invited. All managers spoke explaining historical developments, future plans, ways of working and personal motivations to the suppliers. There was a discussion forum to air and share views and the feedback forms (and informal chats) completed at the end suggested that (a) the event had impressed the suppliers and positively impacted their view of AGS (b) gathered useful data by which suppliers could be engaged (operationally and strategically) (c) increased the willingness to collaborate and negotiate terms with AGS. The management team were also enthusiastic about the collective performance which was captured on video for review and to plan improvements. The event was talked about very positively in the subsequent two management meetings in the informal chat prior to meeting commencing and also in formal review. A number of follow up actions were volunteered by different departments to follow up with different suppliers whom had attended the event to realise cost savings/re negotiations.</p>		

Case 2c – AGS Roadshow to Clients		Achieved?
Outcome	Raise awareness of AGS with clients and build a picture in the minds of clients as a useful ‘value-add’ collaborative partner	Yes

Tangible	Promotional materials	Yes
Intangible	Reputation and relationship enhancement with clients	Yes
Human	Collaborative engagement between departments	Yes
	Empowered management team	Yes
<p>Following on from the success of the supplier engagement run of the “AGS Roadshow” (as it was widely referred to in the organisation), the MD organised for the divisional director of a major potential client to visit AGS (through his regular business development/networking activities). He instructed that the presentation would be rerun (building in improvements and learning from round 1) for the client and his staff on AGS property at a buffet breakfast meeting. The intention was to build up an image of AGS as a progressive organisation with whom the client would benefit in multiple ways should they engage with them as partners. The presentation was run successfully, again by the full management team + the author, to the clear interest of the client. During subsequent discussion, the client revealed that he had used a number of AGS’ cheaper competitors lately and had been badly let down, incurring financial losses and also loss of face with some of his key clients. The presentation was concluded by a tour of the facilities (tidied to inspection standard), after which, the director offered AGS the opportunity to pitch for a number of large value contracts over the subsequent months. This outcome had a visible and vocalised positive motivating effect on the management team and the need to do more of such activities was a sentiment widely expressed.</p>		

Case 3a – Innovation Ideas Bonus		Achieved?
Outcome	Implement an innovation reward scheme to motivate employees and deliver production operations improvements	No
Tangible	Revised production operations	No
Intangible	Culture shift towards continuous improvement	No
Human	Employee motivation	No
<p>Following on from the MD up-skilling by attending a Scottish Enterprise “lean manufacturing” course, an initiative scheme was developed through which employees in the production operation could post ideas into a box in the break room and those</p>		

non-trivial ideas which could save the business money/improve operations would earn the proposer a cash bonus upon implementation. The box was installed in the break room along with an explanatory notice, but was not regularly emptied by the assigned manager. When it was eventually emptied, the manager escalated selected ideas to the MD for approval, but it was not prioritised. As such, the box ceased to be used despite remaining on the wall for about 2 years and the scheme was openly discredited amongst the workforce.

Case 3b – Up-skilling of MD Change Management Knowledge		Achieved?
Outcome	Development of leadership continuous improvement knowledge	Yes
Tangible	-	-
Intangible	-	-
Human	Specific Change Management Skills in MD	Yes
	MD collaborative ability	Yes

Throughout the course of initial KTP application writing, the author emphasised to the MD that an information system is a facilitator and that it was only through action that business improvements could be delivered. Upon appointment of the associate and the commencement of the KTP programme, very quickly the KTP weekly meetings started to include normally around 30 minutes of change management theory /practical examples. This was led by both the academic and the associate (having spent some time lecturing in Pakistan on the topic). The MD was the initiator of such discussions though, asking questions with the openly expressed intention to help him build a vision for how improvements would be realised and what role he needed to play. Initially, a new approach was tried out through the stores project (case 3c & 3d). In addition, despite the initial EFACS launch meetings being replaced by a wider management meeting setting, the informal discussions continued around the KTP activities or at social events. At the end of 2009, the MD reflected openly with the author about a complete revolution in his way of thinking and perceiving the business and how it needs to be improved over the course of the year based on a combination of (a) the discussions (b) self reflection.

Case 3c – Stores Improvement Project		Achieved?
Outcome	Deliver a tangible improvement in the operation of the stores	Yes
Tangible	Reconfigure stores facility layout	Yes
	Deliver stock recovery cost savings and cost avoidances	Yes
Intangible	Systematic stores management mechanism	Yes
Human	Collaboration skills between departments	Yes
	Practical cross departmental business improvement skills	Yes

The KTP funders recommend completing an initial high impact project to introduce the associate to the organisation. Through the course of discussions and ‘walkarounds’, the KTP project team agreed that the stores – housing materials and consumables – represented an opportunity for such an introduction. The stores initial condition was disorganised and difficult to use - following the departure of the storesman the previous year, there had been no employee or manager taking specific ownership for its condition. The idea was conceived to get every single member of staff in the business (including site installation staff and the author) to contribute. A plan to revise the layout, introduce standards, sort stock and set-up ongoing management systems was worked up with the production manager and the KTP team. An all staff meeting was held to explain the plan and over the course of the following week, SA coordinated the implementation of the project in collaboration with one of the production apprentices. The plan was executed on time and all targeted improvements were delivered including a £5000 cost recovery and approximately £10000 cost avoidance from identification of stock not logged on the systems. A project wrap meeting was held in which the associate presented (humorously captioned) photos of the event, a top performer award (vouchers) was given to the apprentice and every member of staff was given a glass of champagne and a handshake to thank them for their efforts.

Case 3d – Waste Metal Management Project		Achieved?
Outcome	Establish an effective waste metal management system to	Yes

	free floor space for value add activity	
Tangible	Freeing up of shop floor and storage space	Yes
	Valorisation of waste stream	Yes
Intangible	Systemise waste metal management ongoing	Yes
Human	Ownership for system taken on by production staff	Yes
<p>Following on from the stores project, the MD expressed a desire to systemise the handling of metal waste. The majority of unit 17 was taken up with waste/scrap metal off cuts as well as about 10% of Unit 18 storage space. This metal had accumulated as (1) it can service any maintenance and repair work on recent installations covered by warranty (2) the price of scrap had more than halved in the previous six months. Discussion between the production manager and the KTP team also uncovered that had rarely, if ever, been an occurrence of (1) and (2) was unlikely to pick up in the medium term. Consequently, to create an appearance of order and make a statement of intent to AGS staff about raising standards, it was decided to move waste/reserve metal to the scrap merchant. To manage offcuts ongoing, a wheelie bin system and visual display was set-up to collect offcuts with a Kanban system triggering disposal at appropriate intervals. This was rapidly implemented and ownership passed into production. Ongoing, the MD was encouraged by the KTP team to show an active interest in the system to embed ownership.</p>		

Case 3e – Continuous Improvement Culture		Achieved?
Outcome	Establish a continuous improvement culture in the business	No
Tangible	Regular cost savings	Yes
	Frequent, incremental modifications to physical assets	Yes
Intangible	Customer relationships benefited from CI activities	No
	High ‘Added-Value’ Reputation	Yes
Human	CI skills and know how broadly embedded in staff	No
	Collaborative improvement abilities	No
	Proactive CI project implementations	No
<p>This overarching aim to specifically engender a continuous improvement culture was elucidated during an introductory interview between the MD and the academic in Aug</p>		

2008. Inspired by meeting with external parties (Scottish Enterprise, other business owners, lean course trainers), the MD expressed an ambition to install a continuous improvement culture within AGS which would deliver regular cost savings and enhancements to the operation. The MD held the view that such improvements would subsequently filter through to noticeable customer benefits, supporting complementary business aims around enhancing reputation and brand building.

Case 3f – Satellite Systems		Achieved?
Outcome	Dispose of satellite shop floor systems	No
Tangible	Disposal of satellite engineering/material stores	Yes
Intangible	Embed revised view of satellite stores	No
Human	Motivate staff to keep shop floor satellite stores free	No
<p>Related to the stores and metal waste management projects was the idea of eliminating satellite systems from the shop floor. Satellite systems are ‘materials, spare parts and tools stored in trolleys and benches on the shop floor without record and as opposed to being logged in the official stores. The MD communicated the need to make such an adjustment to the production manager and over the course of a couple of weeks such adjustments were made. However, no systematic mechanism (such as a regular shop floor standards audit which had been suggested in KTP discussions) was put in place to reinforce the message of satellite store removal and quickly the stores returned. No management enquiries to staff were made on an ongoing basis as to the existence or acceptability of satellite stores.</p>		

Case 3g – Morning Meeting		Achieved?
Outcome	Established a daily production meeting system	No
Tangible	-	-
Intangible	Move towards open information sharing culture	No
Human	Increase manager/operator collaboration in production	No
<p>Following on from KTP discussions about the establishment of base line data, the notion of daily production meetings was floated as a way to start tracking shop floor outputs and engage with the workforce to build relationships for business</p>		

improvement. The idea was given greater prominence after a series of production misses – orders not fulfilled on time because of material issues or manufacturing flaws which were known about operators for a period of time before management were informed. When several of these issues happened in a sequence in a space of about a fortnight, the MD forcefully suggested to the production manager that the situation needed resolved and effectively ordered that morning meetings commenced. The production manager indicated that he didn't have time to do so, suggesting that to run the meetings every morning would cost AGS £96000 per year in wages (a sincere suggestion based on a flawed formula). The MD restated his expectations and over a period of about a month, the production manager periodically ran the morning meeting but it quickly ceased to happen as the MD stopped asking about it.

Case 3h – Business Improvement Meeting		Achieved?
Outcome	Established a collaborative managerial business improvement forum and skill set	Yes
Tangible	-	-
Intangible	Create a managerial system for business improvement	Yes
Human	Instil business improvement skills in managers	No
	Increase cross department collaborative activity	Yes
	Motivate managers to initiate business improvement in their own departments	Yes

Despite the KTP team having established a strong working relationship and routine, it was decided that a wider dialogue was needed with the management team in the business to (1) better explain EFACS (2) address some short term operational issues which were hurting profit and reputation (3) move towards establishing a business improvement capability in the organisation (through a systematic, collective approach). As such, a fortnightly business improvement meeting was established on a Friday morning with all managers required to attend. Of the 7 attendees, 5 had commenced association with the business within the previous 12 months and the meetings had a high energy level and, as the one point in the week when all managers were in the same room, generated much general information exchange as well as business

improvement ideas. A standard agenda was established for meeting where (1) a rolling action plan, maintained by the associate to assign responsibilities for any actions agreed and track delivery, was first reviewed (2) each manager had the opportunity to update on their department's performance issues and ideas (3) the final slot was reserved for any other relevant business. In the second convening of the group, the **AGS Supplier Roadshow (2b)** was proposed and adopted as an idea to develop – this initial big win seemed to energise and encourage the management team. Late October, when the MD was on holiday, the business improvement meeting was hijacked by an extended debate between two departmental managers about how to plan the business – each arguing for the dominance of a different logic (as described in **1e**). Whilst no improvement ideas or consensus emerged, having the two individuals in the room at the one time had stimulated a discussion which provided essential data to the KTP team about issues which needed resolved through EFACS configuration. Several of the improvement ideas emerging from this forum are covered by further within cases – **vendor rating (3i), central planning (3k), quality systems (3m), new room (3n)**. Also, following on from and feeding progress back into the business improvement meetings, several of the departments (Design, contracts, commercial) initiated small improvement ideas with their own staff, realising information clarity enhancements and minor cost savings. Discussions about business improvement fundamentals did not suggest that managers had necessarily developed any new skill set. Instead, the forum seemed to have an emancipating effect on the managers, encouraging them to implement ideas which they had been percolating for a while based on frustrations with issues in AGS' systems. All the recently hired managers attempted to implement some form of change which they had observed having a positive effect in a previous employer.

Case 3i – Vendor Rating		Achieved?
Outcome	Establish a mechanism for assessing vendor performance with a view to prioritise relationship building	No
Tangible	-	-
Intangible	A systematic mechanism for tracking vendor performance	No
Human	Shared understanding about vendor performance	No

An improvement idea emerging from the business improvement meeting was to initialise a vendor rating system that would (1) identify for management or deletion troublesome suppliers which were costing AGS money and reputation as a result of poor service (2) identify the reliable suppliers with whom the business could prioritise relationship building/collaboration (3) create a shared understanding and routine for dealing with all suppliers ongoing. This was unanimously agreed as a good idea, and all managers agreed to trial a prototype paperwork system recording experiences/views of one supplier (everyone rating the same supplier) for the following meeting in a fortnight. At the next meeting, no-one had completed the paperwork and it was resolved to roll the action forward to the next meeting. At the next meeting the same situation occurred and the action was informally dropped by the action not being rolled forward (although no-one actually said not to roll it on!).

Case 3j – Morning Meeting Phase 2		Achieved?
Outcome	Established a daily production meeting system	Yes
Tangible	-	-
Intangible	Move towards open information sharing culture	Yes
Human	Increase manager/operator collaboration in production	Yes
<p>After the failed attempt to set up the morning meeting, the shopfloor foreman left AGS under a compromise agreement (6c), having repeatedly failed to meet performance criteria laid down in role descriptions HR consultancy. The foreman had been a vocal opponent to changes being attempted across the business and in his place, a former shop floor worker with international experience returned (6b) to the organisation following contact from the MD. This individual had experience implementing improvement systems and instantly effected a number of shop floor improvements (from his own initiative) despite not having a management position. Approximately a month after the previous failed attempt to install morning meetings, the new hire, supported by the associate, was charged with setting up the morning meetings. Collaboration was not easily forthcoming from the production manager but the morning meetings did start to happen on a regular basis, using a whiteboard at the side of the shop floor to display daily information and a set of log books, maintained by the</p>		

new hire, to record data ongoing. Ongoing, the MD would use the **business improvement meeting (3h)** to publicly inquire of the production manager if the morning meetings were happening.

Case 3k – Central Planning		Achieved?
Outcome	Create a central master plan for the business	No
Tangible	-	-
Intangible	Modify the approach of departments to information sharing and activity alignment	No
Human	Increase between manager collaboration	Yes

In an attempt to create a new co-ordinative resource in the form of a central master plan for the business, the associate was nominated to develop an integrative MS project planning tool to capture information from each department in an easily updatable and shareable format. The associate was selected as the decision to postpone EFACS until January (see **1d** and **1e**) had just been taken and this activity was seen as integral to resolving the planning logic debate (see **1e** and **3h**). Over the course of c. 6 weeks, the associate attempted to act as a central contact for each department and actively sought out to collect relevant data to model live contracts. However, the desired outcome was not achieved for a variety of reasons (1) lack of willingness or remembrance to share data, particularly when small changes made (2) data incomplete or ambiguous (3) assumptions or preferences for working expressed in data (i.e. some managers emphasised aspects of their data to back up their preferred logic). The decision to abandon the effort was taken collectively at a management meeting – there were no strong arguments for continuing the effort with the production manager actively opposing the idea. However, whilst the main objective was not achieved, levels of collaboration between departments were raised by the activity and concessions in approaches and stated willingness to co-operate were developed.

Case 3m – Quality Systems		Achieved?
Outcome	Establish shop floor quality systems	Yes
Tangible	Quality documentation	Yes

	Cost avoidance	Yes
Intangible	Improved production processes	Yes
	Improved reputation (related to quality)	Yes
	Shift in culture/attitude to quality	Yes
Human	Quality systems knowledge on shop floor	Yes

This initiative was triggered by the confluence of two factors – (1) the potential loss of an experienced operator (headhunted by the recently departed foreman (see **3j**) who had commenced work with a new company) (2) An ongoing issue with costly mistakes being made in production. The operator had signalled to the MD his intent to leave for better wages elsewhere, but indicated that he would stay with AGS if they could match his improved offer. The MD did not want to appear to be held to ransom but equally did not want to lose an experienced and valued operator. Through overlapping discussions at the business improvement meeting about the operator and the ongoing quality issues, it was suggested that if the individual took on a quality systems owner role, he could be justified being offered a higher salary and the business could benefit from some on the ground quality improvements. This idea was floated to the experienced operator who immediately accepted both the increase in reward and the perceived increase in recognition (of his ability to contribute to the business). Under the guidance of the associate, the experienced operator proceeded to design and implement in process checks for the shop floor. He also maintained paperwork tracking defects and rework, incorporating data into the morning meeting schedules. Several production issues which otherwise would have gone to site were stopped in production as a result and a noticeable shift in the attitude to shop floor quality developed.

Case 3n – Set up new meeting facility		Achieved?
Outcome	Create a professional meeting space for collaborative working and business development	Yes
Tangible	Professional meeting location	Yes
Intangible	Improved perception to visitors/clients	Yes
Human	Increased collaboration between managers	Yes

At commencement of the business improvement meetings, the commercial manager's office was used for the sessions (as he had been housed in the last available space in the administrative block, unit 14 – the meeting room). This was a working office filled with paperwork and not conducive to creating a professional impression or facilitating productive discussions. The commercial manager took it upon himself, with the MD's blessing, to hire a portacabin meeting room which he had installed in a junk storage space in unit 14 fitting the carpets himself and organising the facilities connections. This was executed to a high standard within 2 weeks and the resulting facility was a bright, spacious and professionally decorated meeting space. Not only did this free up the commercial manager's office again, it provided an area where visitors could be entertained without fear of interruption. One of the first meetings held in the facility was the successful launch of the AGS customer Roadshow (2c).

Case 4a– Domain purchase		Achieved?
Outcome	Obtain control of a business relevant domain name	No
Tangible	Domain registration	Yes
Intangible	-	-
Human	-	-
<p>A business domain, ags-limited.co.uk, was registered in the first year of the organisation as part of the set-up of business relevant email addresses. This was proposed by the production manager as the IT systems owner at the time and successfully actioned by the MD. The domain ags-limited.co.uk was chosen as various other variants were already taken.</p>		

Case 4b – Set-up relevantly styled content for website		Achieved?
Outcome	Establish a business marketing resource in the form of a professional styled website	No
Tangible	Obtain grant to fund website development	Yes
	Functioning website	Yes
Intangible	Reputation enhancing professional content & style	No
Human	Staff sales motivation	No

Despite having the domain name registered for a number of years, there was no AGS website at the initiation of the project. A google search returned a couple of press releases through Scottish Enterprise about high growth businesses and several business directories provided the company details. This was commented on by nearly all new hire employees as a surprising feature of the organisation and not what was expected of a professional, high-value, high-growth business. With the appointment of a commercial manager, sufficient internal impetus was introduced to form a team to launch a website. The first activity, in March 2009, was that the MD successfully petitioned Scottish Enterprise for a grant to support development work. A local firm red mosquito were subsequently appointed and started to propose themes and content to the team. They suggested updating the company's logo and launching a new aligned brand image. Over the course of May to August a series of meetings were held where styles and content were reviewed but little progress was made, with the MD either directly refusing concepts or failing to respond to material for review. With the advent of the business improvement meetings (3h), the management team had a forum in which to voice concern about the lack of output. The complaints of the managers reflected concerns that (1) in business development discussions, it is common practice to refer potential clients to the company website for exemplars of work or even technical details (2) nearly all competitors have detailed, professional-looking websites with technical content and exemplars (3) the company appears amateurish by not having a website. The MD conceded to allow an interim holding page to be set up (www.ags-limited.co.uk) (which at 31.1.10 is still in place). This was a single page, which did not view properly in mozilla browsers and provided only general contact details. The MD explained that he felt the business had bigger priorities than developing a website and indicated his strong preference for business development to be conducted through face to face meeting and personal contact.

Case 5a– Metal Technology Agreement		Achieved?
Outcome	Contractual franchise established with Metal Technology systems providers	Yes
Tangible	-	-
Intangible	Contractual arrangement to supply a range of metal	Yes

	technology systems	
Human	-	-
<p>With the appointment of a commercial manager (through 6a), the MD had an inhouse expert in the Metal Technology system as the commercial manager had previously been a production manager for Metal Technology. The MD had been searching for several months for an appropriate ‘mid-market’ solution to add to the repertoire of products supplied by AGS in anticipation of a downturn in demand for high end products (given external economic conditions). Metal technology is among a range of mid-price, mid-quality (based on the MD’s understanding of industry perceptions of prestige) product systems. With the commercial manager on-board with AGS, metal technology quickly emerged as the preferred option. The MD negotiated with metal technology and an agreement was entered into in April 09.</p>		

Case 5b– Metal Technology Fixtures and In House Systems		Achieved?
Outcome	Establish the required physical resources to enable AGS to produce Metal Technology products	Yes
Tangible	Production jigs, fixtures and ‘manuals’ (codified system production instructions)	Yes
	Metal technology software system	Yes
Intangible	-	
Human	-	-
<p>Having signed the agreement with Metal Technology, a review of manufacturing requirements was conducted by the production manager in collaboration with the commercial manager to establish the physical equipment required to extend the operating window of the shop floor to accommodate metal technology products. This list generated a number of jigs and fixtures for purchase as well as tooling for specific machines (e.g. dies for the crimper). Purchases were made against this list. Also successfully obtained by the business was Metal technology’s ‘manuals’. Every system provider offers a set of manufacturing instructions to franchisees detailing the recommended method for component creation and assembly of systems. Manuals are typically 200-300 pages, detailing how different products (e.g. windows, curtain</p>		

walling, roof glazing) are made depending on a variety of factors such as customer specific size, loading and environmental conditions. These manuals represent a physical form of the vendor's experience and knowledge in the successful manufacture of the systems and are considered an essential component of system purchase. Finally, all system providers now have software packages which take architectural glazing drawings, verify loading requirements and limits and generate an optimised bill of materials. In effect, once an organisation such as AGS finalise drawings for a client, the system software tests that the correct components have been selected and creates a list of materials to order which should minimise waste. AGS successfully licensed the metal technology systems software.

Case 5c– Metal Technology Training and Development		Achieved?
Outcome	All staff successfully imbued with the requisite knowledge to deliver a client order for metal technology products	No
Tangible	-	-
Intangible	Production processes adapted to incorporate metal technology requirements	No
Human	Staff trained prior to involvement in delivering a live order	No

An order for a metal technology system was secured in June 2009 but it was not delivered at the expected standard or cost. The preparation of cut lists and optimised bills of material were subcontracted back to metal technology as estimation staff had not been trained in the use of the software (this outage was addressed in November 2009, until which time this task was outsourced). In production, several issues emerged. (1) not all physical components (jigs, fixtures, dies) required had been ordered (2) not all those which had been ordered were fit to purpose (3) the knowledge in the manuals had not been fully operationalised and staff were left to improvise some of the required production approaches, resulting in a number of quality defects and a high level of rework. Over the course of approximately two months, system issues were ironed out through labour intensive and improvisational approaches led principally by the commercial manager.

Case 5d – Old system disposal		Achieved?
Outcome	Remove redundant equipment from organisation	Yes
Tangible	Removal of redundant equipment	Yes
	Valorisation of waste	Yes
Intangible	-	-
Human	-	-
<p>Upon the commencement of production of metal technology orders, the MD instructed that components and equipment from a system no longer supported from AGS were removed from site to free up space and support ongoing continuous improvement culture work (3e) based on improving visual standards. Through the MD's contacts, the equipment and material was sold at a reduced rate to a different glazing systems company. This was achieved in one transaction as all equipment and material had been identified and segregated during the stores project (3e)</p>		

Case 5e– Addition of capability to manufacture fire doors		Achieved?
Outcome	Extend manufacturing capability to produce metal fire doors	Yes
Tangible	Production jigs and fixtures for door manufacture	Yes
Intangible	Processes modified to accommodate requirements of door manufacture	Yes
Human	Staff trained in relevant activities to enable the manufacture of fire doors	Yes
<p>Subcontract tenders are normally presented for quotation as packages encompassing a range of components. A recent change in legislation has increased (a) the specifications of and (b) the range of situations in which certified fire doors are required to be installed. In assessing the product range of AGS, the commercial manager perceived that the capability to manufacture such doors would significantly increase the number of tendering opportunities for the business whilst at the same time adding a high value product to the AGS portfolio. With the MD's blessing, he proceeded to make the necessary arrangements through production capability assessment, materials and systems suppliers and staff training requirements to produce</p>		

a prototype door late summer. This door was then used as a sales tool and the first order was won (and successfully produced) in October 2009.

Case 6a – Culture of flexibility and cooperation		Achieved?
Outcome	Create a flexible organisational culture to enable growth	Yes
Tangible	Supporting infrastructure	No
Intangible	Culture of flexibility and cooperation	Yes
Human	Collaborative capability of organisation	Yes

Building on cues from different external events (Scottish Enterprise meetings, industry forums) and previous work with an external HR consultant (9a), the MD espoused an intention to create a culture of flexibility and cooperation for growth within AGS in a discussion with the author in August 2008. Specifically, the MD sought to develop a collective ability within AGS which could allow the organisation to deliver a £5M turnover without the need to staff beyond single people departments, an arrangement which at the time was operating at maximum capacity at a turnover of £3M. In addition to the introduction of a better supporting infrastructure (such as developed through EFACS – case 1) in parallel to an innovative culture of business improvement, the MD envisioned an organisational culture in which individuals had deep technical knowledge but also strong collaborative ability and process thinking approaches. It was his opinion that underpinning such a culture was the personality and capability set of the individuals employed in AGS. Without knowing specifically how he was going to achieve it, the MD indicated that he was setting out to make structural changes within the organisation to reduce the requirement for his own personal effort – in place, he envisioned creating a flexible organisation that would provide the impetus for organic growth.

Case 6b – Arrivals		Achieved?
Outcome	Appoint staff with capabilities and attitude consistent with the requirements of a culture for growth	Yes
Tangible	-	-
Intangible	Culture shift towards flexibility and collaboration	Yes

Human	Increase in organisational stocks of knowledge	Yes
	Increase in organisational collaborative potential	Yes
	Increase in collective motivation/drive of organisation	Yes
<p>Over the course of 12 months from October 2008 until October 2009, the MD, under advisement from the external HR consultant, made a series of appointments within AGS, some in response to events of departure (6c) and some such as the associate (1a), to inject an entirely new skill set into the organisation. These appointments changed the shape of the whole business:-</p> <p>November 08 – Commercial Manager January 09 – KTP associate July 09 - Contracts Manager August 09 – EFACS technician October 09 – Design Manager</p> <p>These individuals each had distinct and well established technical capabilities which were not otherwise strongly evidenced in the business (have never been present or having recently departed). Across appointments however was a common set of attitudinal characteristics – open-mindedness, sociability, willingness to share information, proactiveness and problem solvers.</p>		

Case 6c – Departures		Achieved?
Outcome	Culture shift towards flexibility and collaboration	
Tangible	-	-
Intangible	Culture shift towards flexibility and collaboration	Yes
Human	No decrease in overall organisational stocks of knowledge	Yes
	Increase in organisational collaborative potential	Yes
	Increase in collective motivation/drive of organisation	Yes
<p>In parallel to activity 6b, staff were either negotiated or allowed to leave where it was perceived that they would present a barrier to the new culture or not be able to fully contribute. In the interests of confidentiality, the details in this section do not reveal exact names or positions. The process of assessing the action to be taken was informed by alternative HR projects (9a and 9b) and the MD’s assessment of performance and</p>		

outputs in the past year. All action to be taken was checked with external advisors (legal and HR) prior to enactment. In total, six individuals left the organisation over the period Jan 09 to December 09 and sufficient steps were taken to ensure that, whilst some historical knowledge was lost, the overall organisational stocks of knowledge were maintained at a sufficient level to continue business as usual. In terms of collaboration between departments and between levels within the organisation, 2009 saw an increase in activity, efficiency and output.

Case 7a – Expand premises		Achieved?
Outcome	Obtain more physical production space	Yes
Tangible	Expanded premises	Yes
Intangible	Improve perception of organisation to clients	Yes
Human	Increase staff motivation	Yes

In the summer of 2007, the business was operating from two adjacent factory units (17 and 18) in the Broadmeadow Industrial Estate. Having staffed up nearly 100% and increased production volume by turnover of over 60% in the previous 12 months, the business was rapidly running out space, with no additional production or administrative capacity available nor any meeting facilities. The MD was considering different options at this time, looking at potentially moving to a new location altogether. At this time unit 14, 100 yards from the existing units became available for rental. The MD pitched to lease the property but was unsuccessful, an alternative client having placed an offer first. However, with active scanning of the available market from the MD, unit 14 was quickly secured when the new occupant defaulted on the deal. Unit 14 was set up as the administrative centre for the organisation, the main consideration against such a move being creating a ‘them’ and ‘us’ culture. Unit 14 was fitted out professionally creating office and meeting space, with a reported related improvement in staff morale, motivation and an enhanced appearance of professionalism to potential clients.

Case 7b– Sub contract manufacture		Achieved?
Outcome	Virtually extend manufacturing resource base of organisation	Yes

Tangible	Expanded production capacity	Yes
Intangible	Establish relationship with sub-contract manufacturer	Yes
Human	Build AGS understanding of logistics/sub-contract utilisation	Yes
	Increase internal/external collaboration activity of staff	Yes

Winning several large orders concurrently in May 2009, AGS were faced with a significant capacity shortfall which the MD and the commercial manager decided could not be resolved by overtime or rescheduling of work in-house. As such the MD initiated a search for sub-contract manufacture capacity to commence in July 2009. Several local organisations were identified through formal and informal channels, which the MD and the associate visited early June 2009. Based on an inspection of equipment, processes and standards, a subcontract manufacturer was engaged with and production for a major contract (~£250K) was outsourced in July 2009. Prior to the commencement of manufacture, several meetings were held between AGS and the subcontractor (at different levels/with different functions) to exchange information about processes and protocols. AGS staff, used to operating as subcontractors for clients appeared to easily switch views and engage with subcontractors as clients.

Case 8a– Process Advantage Mapping		Achieved?
Outcome	An explicit, shared managerial understanding of AGS' process based advantage	Yes
Tangible	A codified version of the AGS business process approach	Yes
	Funding to back intervention	Yes
Intangible	Engagement with external facilitation skills	Yes
Human	Management understanding of natural process advantage	Yes
	Management collaborative ability increased	?

Building on discussions with Scottish Enterprise and inspired by various industry forum events attended, the MD initiated an intervention (after winning funding from Scottish Enterprise to cover the costs) facilitated by an external IT consultant to map out the AGS business processes. The MD's motivation for this intervention was that he wanted to clarify and codify the business processes which had emerged organically in AGS as, based on the previous three years performance (formation to £3M turnover),

he perceived them to be at the root of a competitive advantage for AGS. A consultant, (an experienced manager with approximately 30 years experience in a variety of industries) was brought on board. Over the course of several months, the AGS directors met with the consultant chairing discussions to thrash out and agree a map of how the business operated. The results were captured in a large process map and a detailed process specification, referred to as the “functional specification” for AGS. The author was introduced to this document in initial KTP set-up meetings (1a) only after signing a confidentiality agreement, so convinced was the MD that this was the crux of a competitive advantage for AGS. Based on initial meetings with the business directors, the exercise and resultant map was also accompanied by a shared management perception of the natural process advantage of the organisation.

Case 8b– Structured Order Fulfilment		Achieved?
Outcome	Formalised process guides/protocols to extend process advantage to all projects	No
Tangible	Order fulfilment protocols	Yes
Intangible	‘Trade secret’ actively deployed in all business activities	No
Human	All staff comply with process approach	No
	Process based collaboration	No

The MD initiated the creation of order fulfilment protocols to accompany the functional specification created through the process advantage mapping (8a) exercise. These protocols represented work instructions and formal documentation for each step in the process mapping exercise, driven by a motivation to make sure that all new and existing members of staff could comply with the AGS way. These were duly prepared and roll out of the approach was left up to the individual directors. When the author engaged with the MD to set up the **KTP programme (1a)**, the MD described the protocols and their use (which had been implemented for a couple of months). However, when he tried to offer an ‘in use’ demonstration, the vast majority of the protocols and documentation were not being followed. Over the following weeks, this became a theme and it emerged that despite the protocols and documentation being fully prepared, they were not used in the business and the roll out had not succeeded.

Case 9a - Formal Roles and Responsibilities		Achieved?
Outcome	Formalise the responsibilities for each role in the business	Yes
Tangible	Company contract s incorporating roles and responsibilities	Yes
Intangible	Move towards a performance driven culture	No
Human	Staff motivated to own their areas of responsibility	No
<p>With the business having grown rapidly over a period of three years in terms of turnover and staffing levels, the organisation’s human resource systems had failed to develop at the same rate. Engaging an external HR consultant, the MD identified that a crucial outage was the lack of any formal role description and associated responsibilities in employee’s contracts. To provide a degree of control and options in the event of any performance issues emerging in the organisation, the MD instructed the managers to develop responsibilities for each role in collaboration with the HR consultant. These responsibilities were formalised by incorporating them into revised contracts which were issued to operational staff. It had been hoped that this action would drive an increase in the ownership demonstrated by individuals in their area of operation, but this was not evidenced. A further hope had been that as a collective, a more performance driven culture would emerge – again, this did not transpire.</p>		

Case 9b - Management Responsibilities		Achieved?
Outcome	Extend roles and responsibilities to management community	Yes
Tangible	Company contract s incorporating roles and responsibilities	Yes
Intangible	-	-
Human	-	-
<p>Following the successful role out of revised contracts to staff, the same exercise was repeated to the managers in the business, with the MD collaborating with the HR consultant to generate the required documents. This linked in with the human capital exercise (case 6) – when new staff came into the business, the role descriptions and responsibilities were drawn up in advance, forming the basis of the adverts and being presented at the first issue of the contract. Existing managers gradually had their contracts revised.</p>		

Appendix 5.3 – AGS Conceptual Characteristics Matrix

Case	Description	Success?	Resource	Change	Clarity of Outcome	Approach	Energy?	Engagement?	Structure	Org View
1a	Establish relationship with local University	YES	INTANGIBLE	ADD	LOW	AGENCY	HIGH	HIGH	EXTERNAL	FOR
1a	Arrangement of government funding to subsidise KTP associate	YES	TANGIBLE	ADD	HIGH	BALANCE	LOW	HIGH	EXTERNAL	FOR
1a	Access to academic and practitioner know how	YES	HUMAN	ADD	HIGH	ROUTINE	HIGH	HIGH	EXTERNAL	FOR
1a	Recruit additional business resource	YES	HUMAN	ADD	HIGH	ROUTINE	HIGH	LOW	MANAGERIAL	FOR
1b	Specific knowledge for KG to facilitate decision making	YES	HUMAN	ADD	LOW	AGENCY	HIGH	HIGH	EXTERNAL	FOR
1b	Arrangement of funding to facilitate academic time	YES	TANGIBLE	ADD	HIGH	BALANCE	LOW	HIGH	EXTERNAL	FOR
1b	Embed relationship between University and AGS	YES	INTANGIBLE	EXTEND	LOW	BALANCE	HIGH	HIGH	EXTERNAL	FOR
1c	Acquire EFACS Software and Hardware	YES	TANGIBLE	ADD	HIGH	BALANCE	HIGH	LOW	EXTERNAL	FOR
1c	Develop know how of system architecture in AGS	YES	HUMAN	EXTEND	LOW	AGENCY	LOW	HIGH	MANAGERIAL	AGNOSTIC
1c	Arrange further project funding	YES	TANGIBLE	EXTEND	HIGH	ROUTINE	LOW	HIGH	EXTERNAL	FOR
1d	Organisational know how of EFACS	NO	HUMAN	ADD	LOW	BALANCE	HIGH	LOW	ALL INT	AGAINST
1d	Training Media customised to AGS' needs	NO	TANGIBLE	ADD	HIGH	ROUTINE	HIGH	HIGH	EXTERNAL	AGAINST
1e	Software systems reflect business process approach	NO	INTANGIBLE	MODIFY	LOW	ROUTINE	HIGH	HIGH	ALL INT	AGAINST
1f	High-speed communications link between all departments	NO	TANGIBLE	MODIFY	HIGH	ROUTINE	HIGH	LOW	EXTERNAL	FOR
2a	Enhance quality management skills of sub-contract staff	YES	HUMAN	EXTEND	LOW	AGENCY	HIGH	HIGH	EXTERNAL	AGAINST
2a	Revised sub-contract production equipment	YES	TANGIBLE	MODIFY	HIGH	AGENCY	HIGH	LOW	EXTERNAL	AGNOSTIC
2a	Enhance relationship with sub-contract manufacturer	YES	INTANGIBLE	EXTEND	LOW	BALANCE	HIGH	HIGH	EXTERNAL	FOR
2b	Review Material	YES	TANGIBLE	ADD	HIGH	AGENCY	LOW	LOW	MANAGERIAL	FOR
2b	Collaborative engagement between departments	YES	HUMAN	EXTEND	LOW	BALANCE	LOW	HIGH	MANAGERIAL	AGNOSTIC
2b	Empowered management team	YES	HUMAN	MODIFY	LOW	BALANCE	LOW	HIGH	MANAGERIAL	AGNOSTIC
2b	Reputation and relationship enhancement with suppliers	YES	INTANGIBLE	MODIFY	LOW	BALANCE	LOW	LOW	EXTERNAL	AGNOSTIC
2c	Promotional materials	YES	TANGIBLE	EXTEND	HIGH	AGENCY	LOW	HIGH	MANAGERIAL	FOR
2c	Reputation and relationship enhancement with clients	YES	INTANGIBLE	MODIFY	LOW	BALANCE	HIGH	HIGH	EXTERNAL	FOR
2c	Empowered management team	YES	HUMAN	MODIFY	LOW	BALANCE	LOW	HIGH	MANAGERIAL	FOR
2c	Collaborative engagement between departments	YES	HUMAN	EXTEND	LOW	ROUTINE	LOW	HIGH	MANAGERIAL	AGNOSTIC
3a	Modified production operations	NO	TANGIBLE	MODIFY	LOW	AGENCY	LOW	LOW	OPERATIONAL	AGAINST
3a	Employee motivation	NO	HUMAN	MODIFY	LOW	BALANCE	LOW	LOW	OPERATIONAL	AGAINST
3a	Culture shift towards continuous improvement	NO	INTANGIBLE	MODIFY	LOW	ROUTINE	LOW	LOW	OPERATIONAL	AGAINST
3b	Specific Change Management Skills in MD	YES	HUMAN	ADD	HIGH	AGENCY	LOW	HIGH	EXTERNAL	FOR
3b	MD collaborative ability	YES	HUMAN	MODIFY	LOW	BALANCE	HIGH	HIGH	EXTERNAL	FOR
3c	Reconfigure stores facility layout	YES	TANGIBLE	MODIFY	HIGH	AGENCY	HIGH	HIGH	ALL INT	AGAINST
3c	Practical cross departmental business improvement skills	YES	HUMAN	ADD	HIGH	AGENCY	LOW	LOW	ALL INT	AGNOSTIC
3c	Collaboration skills between departments	YES	HUMAN	EXTEND	LOW	BALANCE	HIGH	HIGH	ALL INT	AGAINST
3c	Deliver stock recovery cost savings and cost avoidances	YES	TANGIBLE	MODIFY	HIGH	BALANCE	HIGH	LOW	MANAGERIAL	FOR
3c	Systematic stores management mechanism	YES	INTANGIBLE	MODIFY	HIGH	BALANCE	LOW	HIGH	OPERATIONAL	AGAINST
3d	Ownership for system taken on by production staff	YES	HUMAN	MODIFY	HIGH	AGENCY	HIGH	LOW	OPERATIONAL	AGAINST
3d	Systemise waste metal management ongoing	YES	INTANGIBLE	MODIFY	HIGH	BALANCE	HIGH	LOW	OPERATIONAL	AGAINST
3d	Valorisation of waste stream	YES	TANGIBLE	MODIFY	HIGH	ROUTINE	HIGH	LOW	MANAGERIAL	FOR
3d	Freeing up of shop floor and storage space	YES	TANGIBLE	MODIFY	HIGH	ROUTINE	LOW	HIGH	OPERATIONAL	AGNOSTIC

Case	Description	Success?	Resource	Change	Clarity of Outcome	Approach	Energy?	Engagement?	Structure	Org View
3e	Collaborative improvement abilities	NO	HUMAN	ADD	LOW	AGENCY	LOW	LOW	ALL INT	AGAINST
3e	Customer relationships benefited from CI activities	NO	INTANGIBLE	MODIFY	LOW	AGENCY	LOW	LOW	ALL INT	AGNOSTIC
3e	CI skills and know how broadly embedded in staff	NO	HUMAN	ADD	LOW	BALANCE	LOW	LOW	OPERATIONAL	AGAINST
3e	Motivation to proactively implement CI projects	NO	HUMAN	MODIFY	LOW	BALANCE	LOW	LOW	OPERATIONAL	AGAINST
3e	Regular cost savings	YES	TANGIBLE	ADD	LOW	BALANCE	HIGH	LOW	ALL INT	AGNOSTIC
3e	Frequent, incremental modifications to physical assets	YES	TANGIBLE	MODIFY	LOW	BALANCE	HIGH	LOW	OPERATIONAL	FOR
3e	High 'Added-Value' Reputation	YES	INTANGIBLE	EXTEND	LOW	BALANCE	LOW	LOW	ALL INT	AGNOSTIC
3f	Embed revised view of satellite stores	NO	INTANGIBLE	MODIFY	LOW	BALANCE	LOW	LOW	OPERATIONAL	AGAINST
3f	Motivate staff to keep shop floor satellite stores free	NO	HUMAN	MODIFY	LOW	ROUTINE	LOW	LOW	OPERATIONAL	AGAINST
3f	Disposal of satellite engineering/material stores	YES	TANGIBLE	DELETE	HIGH	AGENCY	HIGH	LOW	OPERATIONAL	AGAINST
3g	Increase manager/operator collaboration in production	NO	HUMAN	MODIFY	LOW	AGENCY	LOW	LOW	OPERATIONAL	AGAINST
3g	Systematic daily information sharing mechanism	NO	INTANGIBLE	MODIFY	HIGH	BALANCE	LOW	LOW	MANAGERIAL	AGAINST
3h	Instil business improvement skills in managers	NO	HUMAN	ADD	LOW	AGENCY	LOW	LOW	MANAGERIAL	AGNOSTIC
3h	Create a managerial system for business improvement	YES	INTANGIBLE	ADD	HIGH	AGENCY	HIGH	HIGH	MANAGERIAL	AGAINST
3h	Increase cross department collaborative activity	YES	HUMAN	MODIFY	LOW	BALANCE	HIGH	HIGH	MANAGERIAL	AGAINST
3h	Motivate managers to initiate business improvement in their own departments	YES	HUMAN	MODIFY	HIGH	BALANCE	LOW	HIGH	MANAGERIAL	FOR
3i	A systematic mechanism for tracking vendor performance	NO	INTANGIBLE	ADD	LOW	AGENCY	LOW	LOW	MANAGERIAL	AGAINST
3i	Shared understanding about vendor performance	NO	HUMAN	ADD	LOW	BALANCE	LOW	LOW	MANAGERIAL	AGAINST
3j	Systematic daily information sharing mechanism	YES	INTANGIBLE	MODIFY	LOW	BALANCE	HIGH	HIGH	OPERATIONAL	AGAINST
3j	Increase manager/operator collaboration in production	YES	HUMAN	MODIFY	LOW	BALANCE	HIGH	HIGH	OPERATIONAL	AGAINST
3j	Physical infrastructure (board, documentation etc)	YES	TANGIBLE	ADD	HIGH	BALANCE	LOW	LOW	OPERATIONAL	AGNOSTIC
3k	Systematic central planning mechanism	NO	INTANGIBLE	MODIFY	HIGH	AGENCY	HIGH	HIGH	MANAGERIAL	AGAINST
3k	Increase between manager collaboration	YES	HUMAN	EXTEND	HIGH	BALANCE	LOW	LOW	MANAGERIAL	AGAINST
3m	Quality knowledge built into production processes	YES	INTANGIBLE	MODIFY	LOW	BALANCE	HIGH	HIGH	OPERATIONAL	AGAINST
3m	Quality systems knowledge on shop floor	YES	HUMAN	EXTEND	HIGH	BALANCE	HIGH	HIGH	OPERATIONAL	AGAINST
3m	Quality documentation	YES	TANGIBLE	ADD	HIGH	AGENCY	HIGH	HIGH	OPERATIONAL	AGAINST
3m	Increase profit through cost avoidance	YES	TANGIBLE	MODIFY	HIGH	BALANCE	LOW	HIGH	OPERATIONAL	AGNOSTIC
3m	Quality systems embedded in operational norms	YES	INTANGIBLE	MODIFY	LOW	ROUTINE	HIGH	HIGH	OPERATIONAL	AGAINST
3m	Improved reputation (related to quality)	YES	INTANGIBLE	MODIFY	LOW	ROUTINE	LOW	LOW	EXTERNAL	AGNOSTIC
3n	Professional meeting location	YES	TANGIBLE	ADD	HIGH	ROUTINE	LOW	LOW	EXTERNAL	FOR
3n	Improved perception to visitors/clients	YES	INTANGIBLE	MODIFY	LOW	ROUTINE	LOW	LOW	MANAGERIAL	AGNOSTIC
3n	Increase collaboration between managers	YES	HUMAN	EXTEND	LOW	ROUTINE	LOW	LOW	MANAGERIAL	AGNOSTIC
4a	Domain registration	YES	TANGIBLE	ADD	HIGH	ROUTINE	HIGH	LOW	EXTERNAL	FOR
4b	Reputation enhancing website professional content & style	NO	INTANGIBLE	ADD	LOW	BALANCE	LOW	LOW	MANAGERIAL	FOR
4b	Functioning website	YES	TANGIBLE	ADD	HIGH	AGENCY	LOW	LOW	MANAGERIAL	FOR
4b	Obtain grant to fund website development	YES	TANGIBLE	ADD	HIGH	ROUTINE	HIGH	LOW	EXTERNAL	FOR
4b	Staff sales motivation	NO	HUMAN	MODIFY	LOW	ROUTINE	LOW	LOW	MANAGERIAL	FOR
5a	Access to a range of metal technology systems	YES	INTANGIBLE	ADD	HIGH	BALANCE	HIGH	HIGH	EXTERNAL	FOR
5b	Metal technology software system	YES	TANGIBLE	ADD	HIGH	ROUTINE	LOW	LOW	OPERATIONAL	FOR
5b	Production jigs, fixtures and 'manuals'	YES	TANGIBLE	ADD	HIGH	ROUTINE	LOW	LOW	MANAGERIAL	FOR
5c	Production processes adapted to incorporate metal technology requirements	NO	INTANGIBLE	EXTEND	LOW	ROUTINE	LOW	LOW	OPERATIONAL	FOR
5c	Staff trained prior to involvement in delivering a live order	NO	HUMAN	EXTEND	LOW	ROUTINE	LOW	LOW	ALL INT	FOR
5d	Removal of redundant equipment	YES	TANGIBLE	DELETE	HIGH	BALANCE	LOW	HIGH	OPERATIONAL	AGNOSTIC
5d	Valorisation of waste	YES	TANGIBLE	MODIFY	HIGH	ROUTINE	HIGH	LOW	EXTERNAL	FOR
5e	Processes modified to accommodate requirements of door manufacture	YES	INTANGIBLE	MODIFY	HIGH	AGENCY	HIGH	HIGH	OPERATIONAL	AGAINST
5e	Staff trained in relevant activities to enable the manufacture of fire doors	YES	HUMAN	ADD	HIGH	BALANCE	HIGH	HIGH	OPERATIONAL	AGAINST
5e	Production jigs and fixtures for door manufacture	YES	TANGIBLE	ADD	HIGH	AGENCY	HIGH	LOW	OPERATIONAL	AGNOSTIC

Case	Description	Success?	Resource	Change	Clarity of Outcome	Approach	Energy?	Engagement ?	Structure	Org View
6a	Supporting infrastructure	NO	TANGIBLE	ADD	LOW	AGENCY	HIGH	LOW	ALL INT	AGAINST
6a	Collaborative capability of organisation	YES	HUMAN	EXTEND	LOW	AGENCY	HIGH	HIGH	MANAGERIAL	AGAINST
6a	Culture of flexibility and cooperation	NO	INTANGIBLE	MODIFY	LOW	AGENCY	HIGH	LOW	ALL INT	AGAINST
6b	Culture shift towards flexibility and collaboration	YES	INTANGIBLE	MODIFY	LOW	AGENCY	HIGH	HIGH	MANAGERIAL	AGAINST
6b	Increase in organisational stocks of knowledge	YES	HUMAN	ADD	LOW	BALANCE	HIGH	HIGH	MANAGERIAL	AGAINST
6b	Increase in organisational collaborative potential	YES	HUMAN	ADD	LOW	BALANCE	HIGH	HIGH	MANAGERIAL	AGAINST
6b	Increase in collective motivation/drive of organisation	YES	HUMAN	ADD	LOW	BALANCE	HIGH	HIGH	MANAGERIAL	AGAINST
6c	Culture shift towards flexibility and collaboration	YES	INTANGIBLE	MODIFY	LOW	AGENCY	HIGH	HIGH	MANAGERIAL	AGAINST
6c	Increase in organisational collaborative potential	YES	HUMAN	ADD	LOW	BALANCE	HIGH	HIGH	MANAGERIAL	AGAINST
6c	Increase in collective motivation/drive of organisation	YES	HUMAN	ADD	LOW	BALANCE	HIGH	HIGH	MANAGERIAL	AGAINST
6c	No decrease in overall organisational stocks of knowledge	YES	HUMAN	DELETE	HIGH	BALANCE	HIGH	LOW	MANAGERIAL	AGAINST
7a	Increase staff motivation	YES	HUMAN	MODIFY	LOW	BALANCE	HIGH	LOW	ALL INT	FOR
7a	Improve perception of organisation to clients	YES	INTANGIBLE	MODIFY	LOW	BALANCE	LOW	LOW	EXTERNAL	AGNOSTIC
7a	Expanded premises	YES	TANGIBLE	ADD	HIGH	BALANCE	HIGH	HIGH	EXTERNAL	FOR
7b	Build AGS understanding of logistics/sub-contract utilisation	YES	HUMAN	EXTEND	LOW	AGENCY	LOW	HIGH	ALL INT	AGNOSTIC
7b	Establish relationship with sub-contract manufacturer	YES	INTANGIBLE	ADD	LOW	BALANCE	HIGH	HIGH	EXTERNAL	FOR
7b	Increase internal/external collaboration activity of staff	YES	HUMAN	EXTEND	LOW	BALANCE	LOW	LOW	ALL INT	AGNOSTIC
7b	Expanded production capacity	YES	TANGIBLE	ADD	HIGH	BALANCE	HIGH	LOW	EXTERNAL	FOR
8a	Engagement with external facilitation skills	YES	INTANGIBLE	ADD	HIGH	ROUTINE	HIGH	HIGH	EXTERNAL	FOR
8a	Management understanding of natural process advantage	YES	HUMAN	ADD	LOW	ROUTINE	HIGH	HIGH	MANAGERIAL	AGNOSTIC
8a	Management collaborative ability increased	YES	HUMAN	EXTEND	LOW	ROUTINE	HIGH	HIGH	MANAGERIAL	AGAINST
8a	A codified version of the AGS business process approach	YES	TANGIBLE	ADD	LOW	BALANCE	HIGH	HIGH	MANAGERIAL	AGNOSTIC
8a	Funding to back intervention	YES	TANGIBLE	ADD	HIGH	ROUTINE	HIGH	HIGH	EXTERNAL	FOR
8b	Process based collaboration	NO	HUMAN	MODIFY	LOW	BALANCE	LOW	LOW	ALL INT	AGAINST
8b	All staff comply with process approach	NO	HUMAN	MODIFY	LOW	ROUTINE	LOW	LOW	ALL INT	AGAINST
8b	'Trade secret' actively deployed in all business activities	NO	INTANGIBLE	EXTEND	LOW	ROUTINE	LOW	LOW	ALL INT	AGAINST
8b	Order fulfilment protocols	YES	TANGIBLE	ADD	HIGH	BALANCE	HIGH	LOW	ALL INT	AGAINST
9a	Company contracts incorporating roles and responsibilities	YES	TANGIBLE	MODIFY	HIGH	AGENCY	HIGH	HIGH	MANAGERIAL	AGAINST
9a	Move towards a performance driven culture	NO	INTANGIBLE	MODIFY	LOW	BALANCE	LOW	LOW	OPERATIONAL	AGAINST
9a	Staff motivated to own their areas of responsibility	NO	HUMAN	MODIFY	LOW	BALANCE	LOW	LOW	OPERATIONAL	AGAINST
9b	Company contracts incorporating roles and responsibilities	YES	TANGIBLE	MODIFY	HIGH	BALANCE	HIGH	LOW	MANAGERIAL	AGAINST

Appendix 5.4 – AGS Additional Quasi-Statistical Analysis

		RESOURCE TYPE			CHANGE TYPE				CLARITY			
		TANGIBLE	INTANGIBLE	HUMAN	ADD	DELETE	MODIFY	EXTEND	HIGH	LOW		
RESOURCE TYPE	TANGIBLE	n/a	n/a	n/a	21	2	12	2	32	5	ANTECEDENT MANAGERIAL INTENTION	
	INTANGIBLE	n/a	n/a	n/a	7	0	21	5	8	25		
	HUMAN	n/a	n/a	n/a	17	1	16	13	10	37		
CHANGE TYPE	ADD	21	7	17	n/a	n/a	n/a	n/a	26	19		
	DELETE	2	0	1	n/a	n/a	n/a	n/a	3	0		
	MODIFY	12	21	16	n/a	n/a	n/a	n/a	17	32		
	EXTEND	2	5	13	n/a	n/a	n/a	n/a	4	16		
CLARITY	HIGH	32	8	10	26	3	17	4	n/a	n/a		
	LOW	5	25	37	19	0	32	16	n/a	n/a		
ATTENTION	HIGH	24	18	22	29	2	25	8	32	32		DEPLOYMENT APPROACH
	LOW	13	15	25	16	1	24	12	18	35		
ENGAGEMENT	HIGH	14	17	25	22	1	20	13	24	32		
	LOW	23	16	22	23	2	29	7	26	35		
APPROACH	NON-ROUTINE	11	12	14	13	1	12	5	15	16		
	ROUTINE	9	8	16	11	0	12	7	15	15		
	BALANCE	11	10	26	21	2	25	8	20	36		
SOCIETY	EXTERNAL	13	11	5	16	0	9	4	17	12	STRUCTURAL CONTEXT	
	MANAGERIAL	10	7	22	17	1	13	8	16	23		
	OPERATIONAL	10	10	10	6	2	20	2	14	16		
	ALL INT	4	5	10	6	0	7	6	3	16		
ORG VIEW	FOR	20	9	10	22	0	11	6	25	14		
	AGAINST	9	18	27	16	2	29	7	18	36		
	AGNOSTIC	8	6	10	7	1	9	7	7	17		
SUCCESS	YES	33	21	33	36	3	31	17	46	41		OUTCOME
	NO	4	12	14	9	0	18	3	4	26		

Table A5.2.1 –Intended change cross-tabulated counts -AGS

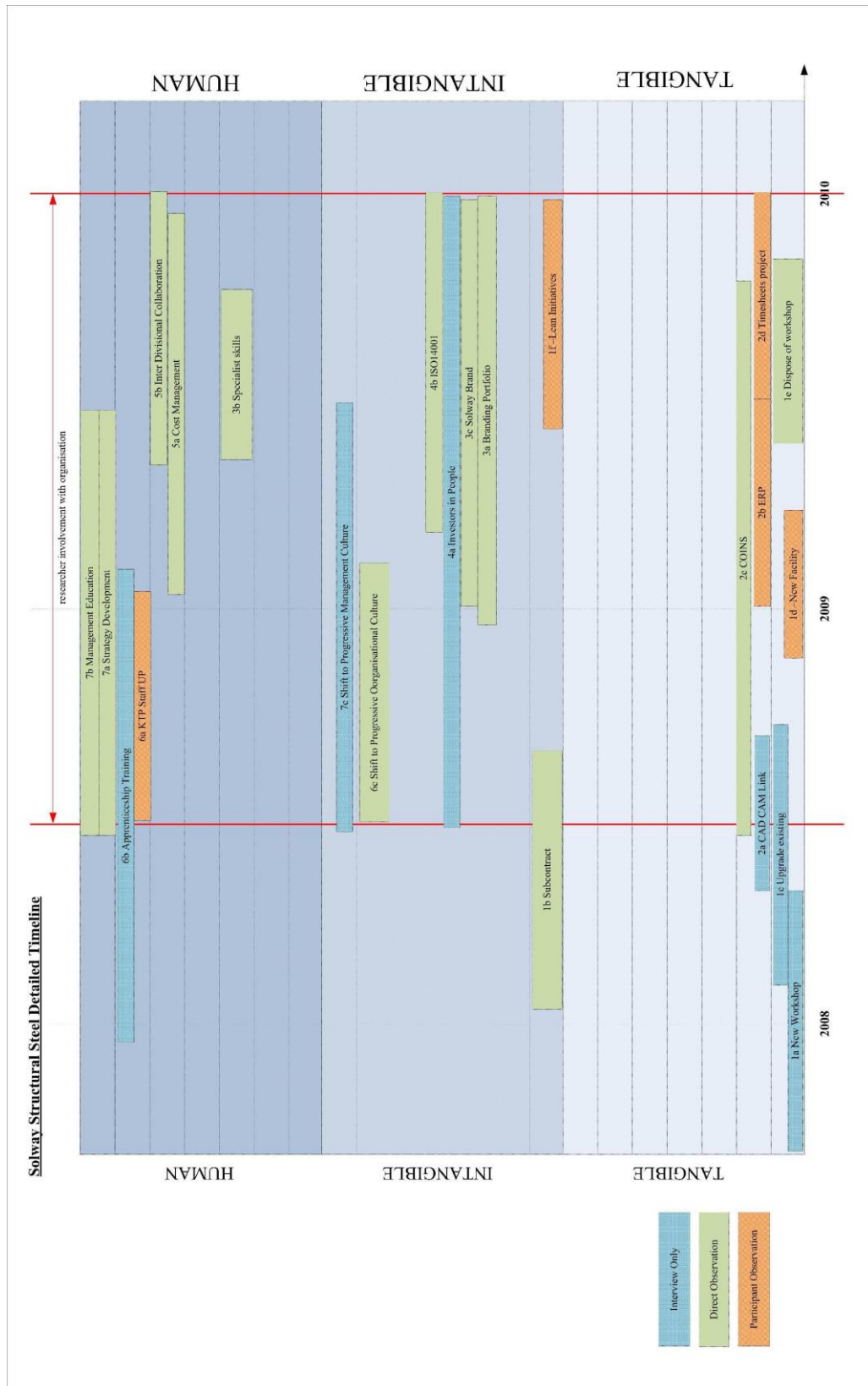
		ATTENTION		ENGAGEMENT		APPROACH			
		HIGH	LOW	HIGH	LOW	NON-ROUTINE	ROUTINE	BALANCE	
RESOURCE TYPE	TANGIBLE	24	13	14	23	11	12	14	ANTECEDENT MANAGERIAL INTENTION
	INTANGIBLE	18	15	17	16	9	8	16	
	HUMAN	22	25	25	22	11	10	26	
CHANGE TYPE	ADD	29	16	22	23	13	11	21	
	DELETE	2	1	1	2	1	0	2	
	MODIFY	25	24	20	29	12	12	25	
	EXTEND	8	12	13	7	5	7	8	
CLARITY	HIGH	32	18	24	26	15	15	20	
	LOW	32	35	32	35	16	15	36	
ATTENTION	HIGH	n/a	n/a	41	23	18	15	31	
	LOW	n/a	n/a	15	38	13	15	25	
ENGAGEMENT	HIGH	41	15	n/a	n/a	16	11	29	
	LOW	23	38	n/a	n/a	15	19	27	
APPROACH	NON-ROUTINE	18	13	16	15	n/a	n/a	n/a	
	ROUTINE	15	15	11	19	n/a	n/a	n/a	
	BALANCE	31	25	29	27	n/a	n/a	n/a	
SOCIETY	EXTERNAL	22	7	18	11	5	11	13	STRUCTURAL CONTEXT
	MANAGERIAL	20	19	22	17	12	9	18	
	OPERATIONAL	13	17	12	18	7	6	17	
	ALL INT	9	10	4	15	7	4	8	
ORG VIEW	FOR	24	15	19	20	6	16	17	
	AGAINST	35	19	27	27	18	8	28	
	AGNOSTIC	5	19	10	14	7	6	11	
SUCCESS	YES	57	30	53	34	22	20	45	OUTCOME
	NO	7	23	3	27	9	10	11	

Table 5.2.2 – Counts of Deployment Approach Factor Characterisations -AGS

		STRUCTURE				ORG VIEW			
		EXTERNAL	MANAGERIAL	OPERATIONAL	ALL INT	FOR	AGAINST	AGNOSTIC	
RESOURCE TYPE	TANGIBLE	13	10	10	4	20	9	8	ANTECEDENT MANAGERIAL INTENTION
	INTANGIBLE	11	7	10	5	9	18	6	
	HUMAN	5	22	10	10	10	27	10	
CHANGE TYPE	ADD	16	17	6	6	22	16	7	
	DELETE	0	1	2	0	0	2	1	
	MODIFY	9	13	20	7	11	29	9	
	EXTEND	4	8	2	6	6	7	7	
CLARITY	HIGH	17	16	14	3	25	18	7	
	LOW	12	23	16	16	14	36	17	
ATTENTION	HIGH	22	20	13	9	24	35	5	
	LOW	7	19	17	10	15	19	19	
ENGAGEMENT	HIGH	18	22	12	4	19	27	10	
	LOW	11	17	18	15	20	27	14	
APPROACH	NON-ROUTINE	5	12	7	7	6	18	7	
	ROUTINE	11	9	6	4	16	8	6	
	BALANCE	13	18	17	8	17	28	11	
SOCIETY	EXTERNAL	n/a	n/a	n/a	n/a	22	2	5	STRUCTURAL CONTEXT
	MANAGERIAL	n/a	n/a	n/a	n/a	12	19	8	
	OPERATIONAL	n/a	n/a	n/a	n/a	3	22	5	
	ALL INT	n/a	n/a	n/a	n/a	2	11	6	
ORG VIEW	FOR	22	12	3	2	n/a	n/a	n/a	
	AGAINST	2	19	22	11	n/a	n/a	n/a	
	AGNOSTIC	5	8	5	6	n/a	n/a	n/a	
SUCCESS	YES	27	32	19	9	34	31	22	OUTCOME
	NO	2	7	11	10	5	23	2	

Table 5.2.3 – Counts of Structural Context Factor Characterisations -AGS

Appendix 5.5 – Solway Time Ordered Display



Appendix 5.6 – Solway Case Narratives

<u>Case 1a- Set-up New Workshop</u>		Achieved?
Outcomes	To create a low volume high variety workshop at the Killoch facility to complement mass manufacturing sites	Yes
Tangible	Expand Workshop Facilities at Killoch	Yes
	Install new equipment at Killoch	Yes
Intangible	Build client relationships through 'detailing' work ability	Yes
Human	Staff up skilled workforce at Killoch	Yes
<p>With an aim of becoming a turnkey solutions provider, the development of a low volume, high variety speciality manufacturing site was undertaken at Solway's Killoch headquarters. This site was to 'detailing work' (finishing components to a client's bespoke standard) and high complexity items such as fire routes. At the time of the initiation of this change, this type of work was outsourced. As the land was already owned by Solway there was no need to procure a new location and an existing building was identified to house new equipment and staff (which involved hiring). The move was viewed positively within the organisation and was successfully delivered.</p>		

<u>Case 1b- Build Key Sub-Contractor Relationships</u>		Achieved?
Outcomes	To establish better relationships with sub-contractors providing complementary services to Solway	No
Tangible	Arrange virtual capacity	Yes
Intangible	Build relationships with high quality local subcontractors	No
	Extend skill base of the organisation for specialist coatings	Yes
Human	Increase external collaborative/vendor management skills in SSS	No
<p>Operating under munificent market conditions, the business frequently struggled to arrange sufficient sub-contract capacity for specialist operations such as chemical treatments and coating (due to high levels of market demand). An improvement of relationships with a range of key sub-contractors was thus targeted to improve the supply of sub-contractor services and effectively the creation of virtual capacity. This was achieved on an arms-length contractual basis at a cost to the business. However, a</p>		

lack of specificity about how to improve relationships and a general high level of business of the operation meant that more collaborative forms of relationship did not develop as initially sketched out. There was also little motivation for the sub-contractors to develop such relationships as the supply of their services was exceeded by market demand and they appeared to prioritise work based on financial gains alone (i.e. Not relating to social gains).

<u>Case 1c – Increase main workshop capacity</u>		Achieved?
Outcomes	Increase the throughput potential of the main mass manufacture facility	Yes
Tangible	Upgrade key constraint existing equipment	Yes
Intangible	Build technological innovation into processes	Yes
	Create showpiece technological centre	Yes
Human	Upskill workforce to use new equipment	Yes
	Increase ability for departments to collaborate	No

To support a growth strategy in light of strong market demand and high levels of profitability, an upgrade of the production capacity of the main workshop was targeted. This involved increasing the amount of plant available for operations, in some cases introducing new technologies and increasing the skills of the workforce to make full use of the facilities. This was also viewed as a reputation- enhancing manoeuvre which could be used to sell the organisation as a potential high volume provider to a wider customer base. Based on the technical experience of the organisation, the introduction of new technology into existing or improved processes was viewed as creating some technological innovative production methods (in relation to competitor methods). A further aim had been to improve the collaborative ability between departments (particularly in different geographical locations) – this did not transpire and similar levels of collaborative ability were replicated

<u>Case 1d – Develop second mass production facility</u>		Achieved?
Outcomes	Create further mass-manufacture capacity for the organisation	No

Tangible	Create a new mass production facility at Killoch	No
Intangible	Incorporate lean practices into facility design	Yes
	Develop a lean culture	No
Human	Tap into University expertise to build feasibility study	Yes
	Extend existing workforce knowledge/ability	No
<p>As potentially profitable market demand continued to outstrip the production capacity of the organisation, the option of developing a second mass manufacture facility in Killoch was explored. This was in addition to the bespoke workshop. A tentative facility design was prepared in collaboration with the University of Strathclyde which was to incorporate lean manufacturing principles in the layout. This was achieved but shortly thereafter, a sharp contraction in market demand (linked to the recession) led to the cancellation of the project. Related efforts to develop a lean culture (engaging with staff to explain lean principles) were not taken further and learning about lean was lost. The lack of achievement of outcome was less a failure than a success of contingent management in light of the changing market conditions</p>		

<u>Case 1e – Decommission low volume workshop</u>		Achieved?
Outcomes	Dispose of bespoke manufacturing workshop	Yes
Tangible	Decommission Killoch Workshop	Yes
Intangible	-	-
Human	Redeploy uniquely skilled workforce to alternate sites	Yes
	Reduce workshop staffing	Yes
<p>As an austerity measure in response to changing market conditions, the low volume workshop was decommissioned to reduce the throughput capacity of the organisation. This involved mothballing the machines, transferring some staff to alternative sites and making redundancies for others. As such, this activity was linked into a consultation process and was successfully enacted in accordance with the terms of the process.</p>		

<u>Case 1f- Develop lean operational approach</u>		Achieved?
Outcomes	To embed lean practices into the organisational culture and	No

	way of working at Solway	
Tangible	Gain funding for support for lean initiatives	Yes
	Modify existing facilities to incorporate lean practices	No
Intangible	Extend relationship with Scottish Enterprise	Yes
Human	Add lean skills to portfolio of workforce	No
	Motivate managers to engage in lean projects	Yes
<p>In response to the development of the concept of ‘lean construction’ at an industry level, initiatives started to emerge relating to the introduction of lean practices into Solway. Such initiatives aligned with the priorities of Scottish Enterprise, a regional development agency, and talks developed and funded support was arranged to pursue the matter further. Waste reduction targets - a key focus of lean – were also introduced into the strategy document for Solway and managerial attention/motivation to deliver against such goals was raised. However, theoretical discussions did not translate into operational level changes as the consultation process related to business downsizing emerged to dominate organisational attention. Furthermore, a high level of organisational resistance to such changes was observed ongoing post-consultation.</p>		

<u>Case 2a – Install strategic CAD CAM link</u>		Achieved?
Outcomes	Create a strategic technical resource integrating design and manufacture	Yes
Tangible	Obtain versions and permissions to establish cross site link	Yes
Intangible	Embed new technology into regular processes	Yes
Human	Add CAD/CAM exploitation knowledge to workforce	Yes
	Build cross site collaborative ability	Yes
<p>With the design unit and manufacturing facility being located at different sites, a strategic improvement to the resource base was identified as the installation of a technological link between the computer aided design (CAD) and computer aided manufacturing (CAM) systems. This CAD/CAM link would automate the transfer of product information, reducing lead times and operator effort and improving accuracy of output. After instigation, technical employees obtained the necessary licences and permissions for the CAD/CAM systems and the link was established. The workforce</p>		

was trained in the use of the new system and work processes redesigned to exploit the potential gains. Implicitly, these other activities delivered an increase in the cross site collaborative ability, which had been an aim of the original project idea.

<u>Case 2b – Develop planning information systems</u>		Achieved?
Outcomes	Develop an automated planning information system	No
Tangible	Purchase software and hardware for ERP implementation	No
Intangible	Establish relationships with system implementer	No
	Set-up integrated planning and control solution to enhance performance	No
Human	Tap into University expertise to conduct feasibility study	Yes
	Embed integrated planning and control know-how into organisation	Yes

A KTP was initiated to develop an integrated production planning and control system. This was based on the identification of vulnerability in the business from inherent uncertainty and high levels of production scheduling changes relating to an awkward, error prone manual system. The change was initially specified as an ERP (enterprise resource planning) implementation to sit alongside other IT systems used in the business. This was to be accompanied by the development of a strategic relationship with a system vendor which could form the basis of ongoing incremental system development efforts post-installation. An initial feasibility study was completed successfully and production planning and control principles were embedded into the management team through engagement over a sustained period. However, business priorities changed with the advent of the economic downturn and the full scale implementation was put on hold.

<u>Case 2c – Implement financial management software</u>		Achieved?
Outcomes	Develop a bespoke financial management software system	Yes
Tangible	Source financial management package	Yes
Intangible	Adapt and modify package to suit requirements of local users	Yes

	Embed usage of package into organisational approach	No
Human	Establish appropriate administrative know how of system	No
<p>To provide greater clarity of the financial position of the organisation as an aid to managerial decision making, a financial management system tailored to the multi-site, multi-product stream of the organisation was commissioned. Upon identification of an appropriate base package, local applications were developed to suit the particular needs of users at different sites and in different roles. However, the use of the package ended up being more restricted than initially anticipated and know how/ administration remained tied to a few individuals</p>		

<u>Case 2d – Create labour data management system</u>		Achieved?
Outcomes	Develop a management information system tracking operational activities	Yes
Tangible	Create system to automate manual administrative process	Yes
Intangible	Move towards improvement culture	Yes
Human	Add automated system processing understanding to organisation	Yes
	Increase departmental collaborative/information sharing ability	Yes
	Motivate managers to engage with each other	Yes
<p>Further to the suspension of the full ERP implementation, the attention of the KTP project was directed towards creating a bespoke management information system reporting weekly labour usage figures from the direct operation. This was a matter of great concern for the management of the organisation as labour is the main cost variable which the organisation can control in the delivery of jobs – in other words, it has a major impact on profitability. Using a database programme, a simple data entry interface and automated processing application was established. The outputs were shared with the management team on a weekly meeting and with the direction of the MD and divisional MD, formed the basis of specific cost-control activities from the management team. This required them to work together to improve the delivery of projects, an initiative which was further prioritised by a worsening of trading</p>		

conditions. The system was developed and trialled in collaboration with managers from different divisions.

<u>Case 3a – Extend product portfolio</u>		Achieved?
Outcomes	Increase the diversity of the organisations product portfolio	No
Tangible	Differentiated product range	No
Intangible	Build reputation as integrated solution provider	No
Human	Establish new markets/client base	No
<p>As reported in case 1a, the business had a targeted aim of developing its production capabilities to include high variety low volume operational capability and a more diverse product portfolio. This intention as initially conceived were derailed by the change in market conditions which reduced the resources available to diversification efforts. A decision was made to focus on the core business (at least temporarily)</p>		

<u>Case 3b – Develop organisational knowledge of branding</u>		Achieved?
<u>Outcomes</u>	Develop branding capability in the organisation	Yes
Tangible	-	-
Intangible	Establish relationship with Business School at the University of Strathclyde	Yes
Human	Hire marketing skills into business	Yes
	Motivate managers to engage in marketing activities	No
<p>In recognition of the need to grow the pool of available customers, Solway aimed to skill up the management team’s knowledge of branding as a low cost option for generating sales growth. A strategic assessment of the marketing/branding efforts of the organisation was undertaken by a team from the department of marketing at the University of Strathclyde. This activity formed the basis of an ongoing relationship with the Strathclyde business school (manifest in different research projects outside the period of investigation of this thesis). At the same time, a vacant management position was filled by an individual identified by the MD as having useful marketing skills (although this was not the principle responsibility of their role). However, efforts to</p>		

motivate the management team to develop their understanding and engage in the enactment of market activities did not transpire as intended. Whilst there was an espoused level of interest in doing such activities (and a shared recognition of the need to do so), the pressures and demands of ongoing consultation and waste reduction efforts proved an overwhelming distraction for the management team.

Case 3c – Reposition Solway Brand		Achieved?
Outcomes	Establish Solway as a stand alone brand rather than an extension of the Barr brand	No
Tangible	Create distinct Solway Website	No
Intangible	Build reputation as an independent material supplier	Yes
	Remove customer association/link to Barr	No
Human	-	-

A change to the reputation of the organisation was initiated through the attempted separation of the Solway Structural Steel and Concrete brand from the Barr organisation. This was a deliberate effort to reposition Solway in the minds of potential clients to allow a shift from a perceived internal-to-Barr materials supplier reputation to a generic-supplier-to-industry organisation reputation. The underpinning logic was that this would broaden the customer base available and therefore maintain the viability of the organisation during difficult trading conditions. This aim was only half achieved however –whilst awareness of Solway’s interest in being seen as an independent material supplier was raised, this did not fully translate into a change in customer perceptions. Evidence was also available to suggest that internal clients unintentionally perpetuated this view through their dealings with the organisation (expectations and attitude in managing Solway contracts). Furthermore, whilst personal marketing techniques supported this repositioning, tangible changes were slow to transpire. For many months after the intended repositioning, the Solway website was still embedded in the Barr site (and would be returned as such by search engines). Therefore, on the timescale initially communicated, this change did not emerge as anticipated.

<u>Case 4a – Gain Investors In People Award</u>		Achieved?
Outcomes	Gain Investors In People Award (IIP) certification	No
Tangible	Create training material to support managerial practice	Yes
Intangible	Move towards a progressive and supportive culture	Yes
	Gain reputation enhancing award	No
Human	Improve organisational collaborative ability	Yes
	Improve managerial soft skills know how	Yes
<p>Investors in People (IIP) is independent certification of the human resource management and personnel development approaches of an organisation against a predetermined standard. The organisation, as part of an ongoing move towards a progressive culture, initiated the pursuit of accreditation. To support general development of human resource practices, the management team was trained in a variety of empathic and situational people management approaches; they were encouraged to collaborate and work together on cultural initiatives and they were provided with documentary and administrative support to roll efforts out. The only missing aspect of this change was obtaining the actual award. This was unsuccessful as a matter of timing as the requirement to conduct a consultation process superseded pushing forward with the award..</p>		

<u>Case 4b- Gain ISO14001 Accreditation</u>		Achieved?
Outcomes	Gain ISO14001 certification	No
Tangible	Create auditable writing protocols governing environmental processes	Yes
Intangible	Improve environmental awareness across departments	Yes
	Gain reputation enhancing award	No
Human	-	-
Who?	<p>ISO14001 is an internationally recognised environmental practice standard against which certification can be an important reputational asset for manufacturing/construction firms. As with case 4a, the targeted addition of such a resource to the organisation was thwarted only by</p>	

	<p>timing as resources required to push through certification were consumed by the requirements of a consultation process. Prior to the change in circumstances, required progress was being made in generating tangible resources (such as environmental management protocols) and a culture of environmental awareness was emerging as evidenced by environmentally sound daily practices (e.g. recycling of waste material) in the wider organisation.</p>
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<u>Case 5a – Consolidation of Operations</u>		Achieved?
Outcomes	To retrench operations in alignment with market conditions	Yes
Tangible	Reduce physical costs through consolidation	Yes
	Dispose of non-useful assets	Yes
Intangible	Shift culture to frugality	Yes
Human	Reconfigure staff to retain skills/know how of organisation	Yes
	Consolidate staffing	Yes
<p>This challenging modification to the resource base was triggered by a sharp contraction in market demand linked to the economic downturn. Following approximately 15 years of annual growth, the construction materials market was suddenly characterised by gross overcapacity (of c. 60% according to the Solway MD based on industry forum figures). Accordingly, Solway had to consolidate its operational capacity in order to minimise losses and survive the downturn. This required the removal or mothballing of physical resources, a change in approach of staff towards austerity and a consolidation of staffing levels. These changes were enacted and ultimately successful but at a huge emotional cost from the management team - consolidation activities represented a major drain on managerial energy and attention over many months.</p>		

<u>Case 5b- Develop internal channels of collaboration</u>		Achieved?
Outcomes	Increase the project level collaboration between different divisions of the organisation	No
Tangible	Increase cash retained within business	No

Intangible	Strengthen inter-divisional relationships	No
Human	Enhance inter-divisional collaborative ability	Yes
<p>In light of the difficult trading conditions, board level direction was rolled down to the organisation to put internal politics to one side and increase the level of collaboration in the wider business. As a result of this instruction, increased opportunity for collaboration was created (e.g. more meeting forums, more general communications issued). However, evidence suggested that these opportunities did not translate into the intended overall outcome as traditional rivalries remained strong and previous ways of acting endured.</p>		

<u>Case 6a – Hire graduate managers</u>		Achieved?
Outcomes	Identify and integrate graduate management candidates into the organisation	Yes
Tangible	Gain funding for KTP initiatives	Yes
Intangible	Establish Relationships with local Universities	Yes
Human	Embed skills into organisation	Yes
	Produce written structured strategic plan	Yes
<p>The divisional MD had previously used the knowledge transfer partnership scheme in a different business to create a pipeline of graduate management talent. On this basis, he engaged with the KTP organisation to structure and document an ongoing programme strategy aimed at recreating these effects. This led to relationships being established with a number of local educational institutes (including the University of Strathclyde, further leading to the initiation of the funded project examined in this study). Thereafter, approximately every 6 months, a new project was initiated resulting in the addition of ‘an associate’ (KTP terminology for a graduate manager) being added to an area of the business to deliver strategic change projects and embed new skills into the organisation.</p>		

<u>Case 6b – Develop inter-departmental collaborative skills</u>		Achieved?
Outcomes	Change the way of working within the Solway organisation towards a cohesive unit rather than individual departments	No

Tangible	-	
Intangible	Develop an integrated, inclusive culture	No
Human	Increase inter-departmental collaborative ability	Yes
	Motivate staff to engage with others in the organisation	No
<p>The current management identified, as a legacy of autocratic regimes under previous ownerships, a highly politicised set of relationships between departments as a source of vulnerability for the organisation. As such, a movement towards a more progressive culture was encouraged in all staff. Cross-functional activity (social as well as operational) was encouraged (such as team based Sports Relief challenges). Related to this aim, further cases described above also had indirect impacts on this intended change. Whilst some gains were made in establishing social channels to improve collaborative ability, in general efforts were undermined by the change in trading conditions and the related enactment of austerity measures.</p>		

<u>Case 6c – Establish vocational training programmes</u>		Achieved?
Outcomes	Develop a pipeline of operational talent in the organisation	Yes
Tangible	-	-
Intangible	Establish relationship with local Vocational Training Centres	Yes
Human	Increase skills and know-how of younger staff based on external practice	Yes
<p>In parallel to developing a steady feed of graduate management talent entering the business, the organisation targeted the development of future operational skills through the establishment of vocational training programmes. The organisation successfully co-ordinated with local vocational training centres (inc. Local colleges) to arrange apprenticeship and vocational training programmes for operational staff. These arrangements were conducted in a structured, documented manner in line with IIP (case 4a) requirements.</p>		

<u>Case 7a- Develop strategy</u>		Achieved?
Outcomes	Create a formal strategy for the organisation	Yes

Tangible	Formal strategy document	Yes
Intangible	Move towards a unified managerial culture	Yes
Human	Arrange use of external strategic facilitation skills	Yes
<p>Previous owners of the organisation had eschewed formal strategy approaches in favour of top down ad-hoc direction setting. To counter this approach and operate in a more inclusive manner, Solway senior management initiated a formal strategy development programme facilitated by an external consultant. This process involved the development of a structured, target oriented document with the involvement of functional/departmental managers. It was published as a cohesive document and reviewed ongoing for progress at regular junctures throughout the year for progressive. It is widely viewed in the management team as being an influential and integrating activity which has benefited the organisation and improved the way management of different levels interact</p>		

<u>Case 7b – Establish management education programme</u>		Achieved?
Outcomes	Create a structured management development programme	Yes
Tangible	-	
Intangible	Move towards a unified managerial culture	Yes
Human	Increase managerial know how about managerial best practice	Yes
	Motivate managers to apply management approach	Yes
<p>In parallel to the development of a structured graduate management intake programme through KTP, a management education programme was instigated. This was intended to increase managerial awareness of best practice approaches such as lean manufacturing, health and safety practice etc. Run in conjunction with the strategy development exercise, the programme proved popular with the managerial team and the techniques as trained were largely deployed in the organisation. The social interaction and shared understanding did move the business towards a more integrated managerial culture.</p>		

<u>Case 7c – Develop management collaboration skills</u>	Achieved?
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Outcomes	Modify managerial skill sets to include collaboration skills	Yes
Tangible	-	-
Intangible	Move towards a progressive management approach/culture	Yes
Human	Managerial collaborative skills	Yes
<p>Through a variety of initiatives, encourage peer to peer and two way hierarchical managerial communication and feedback was encouraged in the management community. This included facilitated away days and ongoing activities in parallel with the management education programme. Over the period of investigation, the managers engaged with reported an improvement in their collaborative skills and a move towards a unified, progressive culture.</p>		

Appendix 5.7 – Solway Conceptual Characteristics Matrix

Case	Description	Success?	Resource	Change	Clarity of Outcome	Approach	Energy?	Engagement?	Structure	Org View
1a	Expand Workshop Facilities at Killoch	YES	TANGIBLE	MODIFY	HIGH	BALANCE	LOW	HIGH	ALL INT	FOR
1a	Install new equipment at Killoch	YES	TANGIBLE	ADD	HIGH	ROUTINE	LOW	HIGH	ALL INT	FOR
1a	Build client relationships through 'detailing' work ability	YES	INTANGIBLE	ADD	LOW	AGENCY	HIGH	LOW	EXTERNAL	FOR
1a	Staff up skilled workforce at Killoch	YES	HUMAN	EXTEND	HIGH	ROUTINE	LOW	LOW	MANAGERIAL	FOR
1b	Arrange virtual capacity	YES	TANGIBLE	ADD	HIGH	BALANCE	LOW	LOW	EXTERNAL	FOR
1b	Build relationships with high quality local subcontractors	NO	INTANGIBLE	ADD	LOW	AGENCY	LOW	LOW	EXTERNAL	FOR
1b	Extend skill base of the organisation for specialist coatings	YES	INTANGIBLE	ADD	LOW	BALANCE	LOW	LOW	EXTERNAL	FOR
1c	Increase external collaborative/vendor management skills in SSS	NO	HUMAN	EXTEND	LOW	ROUTINE	LOW	LOW	ALL INT	AGAINST
1c	Upgrade key constraint existing equipment	YES	TANGIBLE	MODIFY	HIGH	ROUTINE	LOW	LOW	MANAGERIAL	FOR
1c	Build technological innovation into processes	YES	INTANGIBLE	MODIFY	HIGH	BALANCE	LOW	LOW	MANAGERIAL	FOR
1c	Create showpiece technological centre	YES	INTANGIBLE	ADD	LOW	AGENCY	LOW	HIGH	MANAGERIAL	FOR
1c	Upskill workforce to use new equipment	YES	HUMAN	EXTEND	HIGH	BALANCE	LOW	LOW	ALL INT	FOR
1c	Increase ability for departments to collaborate	NO	HUMAN	EXTEND	LOW	BALANCE	LOW	LOW	ALL INT	AGAINST
1d	Create a new mass production facility at Killoch	NO	TANGIBLE	ADD	HIGH	AGENCY	LOW	LOW	MANAGERIAL	FOR
1d	Incorporate lean practices into facility design	YES	INTANGIBLE	MODIFY	LOW	AGENCY	LOW	LOW	EXTERNAL	AGNOSTIC
1d	Develop a lean culture	NO	INTANGIBLE	MODIFY	LOW	ROUTINE	LOW	LOW	ALL INT	AGAINST
1d	Tap into University expertise to build feasibility study	YES	HUMAN	ADD	LOW	BALANCE	HIGH	HIGH	EXTERNAL	FOR
1d	Extend existing workforce knowledge/ability	NO	HUMAN	EXTEND	LOW	ROUTINE	LOW	LOW	OPERATIONAL	AGAINST
1e	Decommission Killoch Workshop	YES	TANGIBLE	DELETE	HIGH	AGENCY	HIGH	LOW	MANAGERIAL	AGAINST
1e	Redeploy uniquely skilled workforce to alternate sites	YES	HUMAN	MODIFY	HIGH	BALANCE	LOW	LOW	MANAGERIAL	AGNOSTIC
1e	Reduce workshop staffing	YES	HUMAN	DELETE	HIGH	BALANCE	HIGH	LOW	OPERATIONAL	AGAINST
1f	Gain funding for support for lean initiatives	YES	TANGIBLE	ADD	HIGH	ROUTINE	HIGH	LOW	EXTERNAL	FOR
1f	Modify existing facilities to incorporate lean practices	NO	TANGIBLE	MODIFY	LOW	ROUTINE	LOW	LOW	ALL INT	AGAINST
1f	Extend relationship with Scottish Enterprise	YES	INTANGIBLE	EXTEND	HIGH	BALANCE	HIGH	LOW	EXTERNAL	FOR
1f	Add lean skills to portfolio of workforce	NO	HUMAN	ADD	LOW	ROUTINE	LOW	LOW	ALL INT	AGAINST
1f	Motivate managers to engage in lean projects	YES	HUMAN	MODIFY	HIGH	BALANCE	HIGH	LOW	MANAGERIAL	AGAINST
2a	Obtain versions and permissions to establish cross site link	YES	TANGIBLE	ADD	HIGH	AGENCY	LOW	LOW	MANAGERIAL	FOR
2a	Embed new technology into regular processes	YES	INTANGIBLE	MODIFY	HIGH	BALANCE	LOW	LOW	MANAGERIAL	FOR
2a	Add CAD/CAM exploitation knowledge to workforce	YES	HUMAN	ADD	HIGH	ROUTINE	LOW	LOW	ALL INT	FOR
2a	Build cross site collaborative ability	YES	HUMAN	MODIFY	HIGH	BALANCE	LOW	LOW	MANAGERIAL	AGNOSTIC
2b	Purchase software and hardware for ERP implementation	NO	TANGIBLE	ADD	HIGH	AGENCY	LOW	HIGH	MANAGERIAL	FOR
2b	Establish relationships with system implementor	NO	INTANGIBLE	ADD	HIGH	BALANCE	LOW	LOW	MANAGERIAL	FOR
2b	Tap into University expertise to conduct feasibility study	YES	HUMAN	ADD	LOW	BALANCE	LOW	HIGH	EXTERNAL	FOR
2b	Set-up integrated planning and control solution to enhance performance	NO	INTANGIBLE	MODIFY	LOW	BALANCE	LOW	HIGH	MANAGERIAL	FOR
2b	Embed integrated planning and control know-how into organisation	YES	HUMAN	MODIFY	LOW	BALANCE	LOW	HIGH	ALL INT	AGAINST
2c	Source financial management package	YES	TANGIBLE	ADD	LOW	AGENCY	LOW	HIGH	MANAGERIAL	FOR
2c	Adapt and modify package to suit requirements of local users	YES	INTANGIBLE	MODIFY	HIGH	BALANCE	LOW	HIGH	MANAGERIAL	FOR
2c	Embed usage of package into organisational approach	NO	INTANGIBLE	MODIFY	LOW	ROUTINE	LOW	LOW	ALL INT	AGAINST
2c	Establish appropriate administrative know how of system	NO	HUMAN	ADD	LOW	ROUTINE	LOW	LOW	OPERATIONAL	AGAINST
2d	Create system to automate manual administrative process	YES	TANGIBLE	ADD	LOW	BALANCE	LOW	HIGH	MANAGERIAL	FOR
2d	Move towards improvement culture	YES	INTANGIBLE	MODIFY	LOW	BALANCE	LOW	HIGH	MANAGERIAL	FOR
2d	Add automated system processing understanding to organisation	YES	HUMAN	ADD	LOW	BALANCE	LOW	HIGH	ALL INT	FOR
2d	Increase departmental collaborative/information sharing ability	YES	HUMAN	EXTEND	LOW	BALANCE	LOW	HIGH	MANAGERIAL	FOR
2d	Motivate managers to engage with each other	YES	HUMAN	MODIFY	LOW	AGENCY	HIGH	HIGH	MANAGERIAL	AGAINST

Case	Description	Success?	Resource	Change	Clarity of Outcome	Approach	Energy?	Engagement?	Structure	Org View
3a	Differentiated product range	NO	TANGIBLE	MODIFY	LOW	ROUTINE	LOW	LOW	MANAGERIAL	AGNOSTIC
3a	Build reputation as integrated solution provider	NO	INTANGIBLE	MODIFY	LOW	BALANCE	HIGH	LOW	EXTERNAL	AGNOSTIC
3a	Establish new markets/client base	NO	INTANGIBLE	ADD	LOW	ROUTINE	HIGH	LOW	EXTERNAL	AGAINST
3b	Establish relationship with UoS Business School marketing	YES	INTANGIBLE	ADD	HIGH	BALANCE	LOW	LOW	EXTERNAL	FOR
3b	Hire marketing skills into business	YES	HUMAN	ADD	HIGH	BALANCE	HIGH	LOW	MANAGERIAL	FOR
3b	Motivate managers to engage in marketing activities	NO	HUMAN	MODIFY	HIGH	ROUTINE	LOW	HIGH	MANAGERIAL	AGAINST
3c	Create distinct Solway Website	NO	TANGIBLE	ADD	LOW	ROUTINE	LOW	LOW	MANAGERIAL	FOR
3c	Build reputation as an independent material supplier	YES	INTANGIBLE	MODIFY	LOW	AGENCY	HIGH	LOW	EXTERNAL	AGNOSTIC
3c	Remove customer association/link to Barr	NO	INTANGIBLE	DELETE	LOW	AGENCY	HIGH	LOW	EXTERNAL	AGAINST
4a	Move towards a progressive and supportive culture	YES	INTANGIBLE	MODIFY	LOW	ROUTINE	HIGH	HIGH	ALL INT	AGAINST
4a	Gain reputation enhancing award	NO	INTANGIBLE	ADD	HIGH	BALANCE	LOW	HIGH	ALL INT	AGNOSTIC
4a	Create training material to support managerial practice	YES	TANGIBLE	ADD	HIGH	ROUTINE	LOW	LOW	MANAGERIAL	FOR
4a	Improve organisational collaborative ability	YES	HUMAN	MODIFY	LOW	BALANCE	LOW	HIGH	ALL INT	AGNOSTIC
4a	Improve managerial soft skills know how	YES	HUMAN	EXTEND	LOW	BALANCE	LOW	HIGH	MANAGERIAL	FOR
4b	Create auditable writing protocols governing environmental processes	YES	TANGIBLE	ADD	HIGH	ROUTINE	LOW	HIGH	MANAGERIAL	FOR
4b	Improve environmental awareness across departments	YES	INTANGIBLE	MODIFY	LOW	BALANCE	LOW	HIGH	ALL INT	AGNOSTIC
5a	Reduce physical costs through consolidation	YES	TANGIBLE	MODIFY	HIGH	BALANCE	HIGH	LOW	ALL INT	AGAINST
5a	Dispose of non-useful assets	YES	TANGIBLE	DELETE	HIGH	AGENCY	HIGH	LOW	MANAGERIAL	AGAINST
5a	Shift culture to frugality	YES	INTANGIBLE	MODIFY	LOW	BALANCE	HIGH	HIGH	MANAGERIAL	FOR
5a	Reconfigure staff to retain skills/know how of organisation	YES	HUMAN	MODIFY	LOW	BALANCE	LOW	HIGH	MANAGERIAL	FOR
5a	Retain motivation of staff	NO	HUMAN	EXTEND	LOW	BALANCE	LOW	HIGH	ALL INT	AGNOSTIC
5a	Consolidate staffing	YES	HUMAN	DELETE	HIGH	BALANCE	HIGH	LOW	ALL INT	AGAINST
5b	Increase cash retained within business	NO	TANGIBLE	EXTEND	HIGH	AGENCY	HIGH	LOW	EXTERNAL	AGAINST
5b	Strengthen inter-divisional relationships	NO	INTANGIBLE	MODIFY	LOW	AGENCY	HIGH	LOW	EXTERNAL	AGAINST
5b	Enhance inter-divisional collaborative ability	YES	HUMAN	MODIFY	LOW	BALANCE	HIGH	HIGH	MANAGERIAL	AGAINST
6a	Gain funding for KTP initiatives	YES	TANGIBLE	ADD	HIGH	ROUTINE	HIGH	LOW	EXTERNAL	FOR
6a	Establish Relationships with local Universities	YES	INTANGIBLE	ADD	LOW	ROUTINE	LOW	LOW	EXTERNAL	FOR
6a	Embed skills into organisation	YES	HUMAN	ADD	LOW	BALANCE	LOW	HIGH	MANAGERIAL	FOR
6a	Produce written structured strategic plan	YES	TANGIBLE	ADD	LOW	ROUTINE	HIGH	HIGH	MANAGERIAL	AGAINST
6b	Move towards an integrated, inclusive culture	NO	INTANGIBLE	MODIFY	LOW	ROUTINE	LOW	HIGH	MANAGERIAL	AGAINST
6b	Increase inter-departmental collaborative ability	NO	HUMAN	ADD	LOW	ROUTINE	LOW	HIGH	MANAGERIAL	AGAINST
6b	Motivate staff to engage with others in the organisation	NO	HUMAN	ADD	LOW	ROUTINE	LOW	LOW	ALL INT	AGAINST
6c	Establish relationship with local Vocational Training Centres	YES	INTANGIBLE	ADD	HIGH	BALANCE	LOW	LOW	MANAGERIAL	FOR
6c	Develop a modern workforce culture	NO	INTANGIBLE	MODIFY	LOW	ROUTINE	LOW	HIGH	ALL INT	AGAINST
6c	Increase skills and know-how of younger staff based on external practice	YES	HUMAN	EXTEND	HIGH	BALANCE	LOW	LOW	MANAGERIAL	FOR
6c	Motivate apprentices to collaborate and engage	NO	HUMAN	MODIFY	LOW	AGENCY	LOW	LOW	MANAGERIAL	AGAINST
7a	Move towards a unified managerial culture	YES	INTANGIBLE	MODIFY	LOW	BALANCE	HIGH	HIGH	MANAGERIAL	AGAINST
7a	Hire in strategic facilitation skills	YES	HUMAN	ADD	HIGH	ROUTINE	HIGH	LOW	EXTERNAL	FOR
7b	Move towards a unified managerial culture	YES	INTANGIBLE	MODIFY	LOW	BALANCE	LOW	HIGH	MANAGERIAL	FOR
7b	Increase managerial know how about managerial best practice	YES	HUMAN	EXTEND	HIGH	BALANCE	LOW	LOW	MANAGERIAL	FOR
7b	Increase managerial ability to collaborate	NO	HUMAN	EXTEND	LOW	BALANCE	LOW	HIGH	MANAGERIAL	AGAINST
7b	Motivate managers to apply management approach	YES	HUMAN	MODIFY	LOW	ROUTINE	HIGH	HIGH	MANAGERIAL	AGAINST
7c	Move towards a more progressive management approach/culture	YES	INTANGIBLE	MODIFY	LOW	BALANCE	HIGH	HIGH	MANAGERIAL	AGAINST
7c	Raise managerial awareness of impact of issues	YES	HUMAN	EXTEND	LOW	BALANCE	LOW	LOW	MANAGERIAL	AGNOSTIC

Appendix 5.8 – Solway Quasi-Statistics Tables

		RESOURCE TYPE			CHANGE TYPE				CLARITY			
		TANGIBLE	INTANGIBLE	HUMAN	ADD	DELETE	MODIFY	EXTEND	HIGH	LOW		
RESOURCE TYPE	TANGIBLE	n/a	n/a	n/a	13	2	5	1	15	6	ANTECEDENT MANAGERIAL INTENTION	
	INTANGIBLE	n/a	n/a	n/a	10	1	19	1	8	23		
	HUMAN	n/a	n/a	n/a	11	2	11	12	13	23		
CHANGE TYPE	ADD	13	10	11	n/a	n/a	n/a	n/a	16	18		
	DELETE	2	1	2	n/a	n/a	n/a	n/a	4	1		
	MODIFY	5	19	11	n/a	n/a	n/a	n/a	10	25		
	EXTEND	1	1	12	n/a	n/a	n/a	n/a	6	8		
CLARITY	HIGH	15	8	13	16	4	10	6	n/a	n/a		
	LOW	6	23	23	18	1	25	8	n/a	n/a		
ATTENT-ION	HIGH	7	11	9	8	5	12	2	12	15		DEPLOYMENT APPROACH
	LOW	14	20	27	26	0	23	12	24	37		
ENGAGE-MENT	HIGH	7	13	16	13	0	19	4	7	29		
	LOW	14	18	20	21	5	16	10	29	23		
APPROACH	NON-ROUTINE	2	7	7	7	3	1	5	6	10		
	ROUTINE	11	7	10	15	0	3	10	10	18		
	BALANCE	23	17	4	12	2	10	20	20	24		
SOCIETY	EXTERNAL	4	12	3	12	1	4	2	7	12	STRUCTURAL CONTEXT	
	MANAGERIAL	13	13	19	15	2	21	7	21	24		
	OPERATIONAL	0	0	3	1	1	0	1	1	2		
	ALLINT	4	6	11	6	1	10	4	7	14		
ORG VIEW	FOR	14	16	14	27	0	10	7	25	19		
	AGAINST	6	10	17	6	5	17	5	8	25		
	AGNOSTIC	1	5	5	1	0	8	2	3	8		
SUCCESS	YES	15	19	25	23	4	24	8	30	29	OUTCOME	
	NO	6	12	11	11	1	11	6	6	23		

Counts of Antecedent Managerial Intention Factor Characterisations in the Solway Case Context

		RESOURCE TYPE			CHANGE TYPE				CLARITY			
		TANGIBLE	INTANGIBLE	HUMAN	ADD	DELETE	MODIFY	EXTEND	HIGH	LOW		
RESOURCE TYPE	TANGIBLE	n/a	n/a	n/a	⇒ 38%	⇒ 40%	↓ 14%	↓ 7%	⇒ 42%	↓ 12%	ANTECEDENT MANAGERIAL INTENTION	
	INTANGIBLE	n/a	n/a	n/a	⇒ 29%	⇒ 20%	↑ 54%	↓ 7%	⇒ 22%	⇒ 44%		
	HUMAN	n/a	n/a	n/a	⇒ 32%	⇒ 40%	⇒ 31%	↑ 86%	⇒ 36%	⇒ 44%		
CHANGE TYPE	ADD	↑ 62%	⇒ 32%	⇒ 31%	n/a	n/a	n/a	n/a	↑ 44%	⇒ 35%		
	DELETE	↓ 10%	↓ 3%	↓ 6%	n/a	n/a	n/a	n/a	↓ 11%	↓ 2%		
	MODIFY	⇒ 24%	↑ 61%	⇒ 31%	n/a	n/a	n/a	n/a	⇒ 28%	↑ 48%		
	EXTEND	↓ 5%	↓ 3%	⇒ 33%	n/a	n/a	n/a	n/a	⇒ 17%	⇒ 15%		
CLARITY	HIGH	⇒ 71%	⇒ 26%	⇒ 36%	⇒ 47%	↑ 80%	⇒ 29%	⇒ 43%	n/a	n/a		
	LOW	⇒ 29%	⇒ 74%	⇒ 64%	⇒ 53%	↓ 20%	⇒ 71%	⇒ 57%	n/a	n/a		
ATTENTION	HIGH	⇒ 33%	⇒ 35%	⇒ 25%	↓ 24%	↑ 100%	⇒ 34%	↓ 14%	⇒ 33%	⇒ 29%		DEPLOYMENT APPROACH
	LOW	⇒ 67%	⇒ 65%	↑ 75%	↑ 76%	↓ 0%	⇒ 66%	↑ 86%	⇒ 67%	⇒ 71%		
ENGAGEMENT	HIGH	⇒ 33%	⇒ 42%	⇒ 44%	⇒ 38%	↓ 0%	⇒ 54%	⇒ 29%	↓ 19%	⇒ 56%		
	LOW	⇒ 67%	⇒ 58%	⇒ 56%	⇒ 62%	↑ 100%	⇒ 46%	⇒ 71%	↑ 81%	⇒ 44%		
APPROACH	NON-ROUTINE	↓ 6%	⇒ 23%	⇒ 33%	⇒ 21%	↑ 60%	↓ 7%	↓ 14%	↓ 17%	⇒ 19%		
	ROUTINE	⇒ 31%	⇒ 23%	⇒ 48%	⇒ 44%	↓ 0%	⇒ 21%	⇒ 29%	⇒ 28%	⇒ 35%		
	BALANCE	↑ 64%	↑ 55%	⇒ 19%	⇒ 35%	⇒ 40%	↑ 71%	↑ 57%	↑ 56%	⇒ 46%		
SOCIETY	EXTERNAL	⇒ 19%	↑ 39%	↓ 8%	⇒ 35%	⇒ 20%	↓ 11%	↓ 14%	⇒ 19%	⇒ 23%		
	MANAGERIAL	↑ 62%	↑ 42%	↑ 53%	⇒ 44%	⇒ 40%	↑ 60%	↑ 50%	↑ 58%	↑ 46%		
	OPERATIONAL	↓ 0%	↓ 0%	↓ 8%	↓ 3%	⇒ 20%	↓ 0%	↓ 7%	↓ 3%	↓ 4%		
	ALL INT	⇒ 19%	⇒ 19%	⇒ 31%	⇒ 18%	⇒ 20%	⇒ 29%	⇒ 29%	⇒ 19%	⇒ 27%		
ORG VIEW	FOR	↑ 67%	↑ 52%	⇒ 39%	↑ 79%	↓ 0%	⇒ 29%	↑ 50%	↑ 69%	⇒ 37%		
	AGAINST	⇒ 29%	⇒ 32%	⇒ 47%	⇒ 18%	↑ 100%	⇒ 49%	⇒ 36%	⇒ 22%	⇒ 48%		
	AGNOSTIC	↓ 5%	↓ 16%	↓ 14%	↓ 3%	↓ 0%	⇒ 23%	↓ 14%	↓ 8%	↓ 15%		
SUCCESS	YES	⇒ 71%	⇒ 61%	⇒ 69%	⇒ 68%	↑ 80%	⇒ 69%	⇒ 57%	↑ 83%	⇒ 56%	OUTCOME	
	NO	⇒ 29%	⇒ 39%	⇒ 31%	⇒ 32%	↓ 20%	⇒ 31%	⇒ 43%	↓ 17%	⇒ 44%		

Key	The visual indicator colour corresponds to a value of entry in a table cell as determined by the number of options in the vertical category (see appendix 4.3 for further explanation)	2 options	3 options	4 options
		<25%	<16.7%	<12.5%
		25-75%	16.7% - 50%	12.5-37.5%
		>75%	>50%	>37.5%

Solway Context % presence of Antecedent Managerial Intention Factors by Other Factors (must be read top to bottom and not left to right)

		RESOURCE TYPE			CHANGE TYPE				CLARITY			
		TANGIBLE	INTANGIBLE	HUMAN	ADD	DELETE	MODIFY	EXTEND	HIGH	LOW		
SUCCESS RATE		↑ 71%	⇒ 61%	↑ 69%	↑ 68%	↑ 80%	↑ 69%	⇒ 57%	↑ 83%	⇒ 56%		
RESOURCE TYPE	TANGIBLE	n/a	n/a	n/a	↑ 77%	↑ 100%	⇒ 60%	↓ 0%	↑ 80%	⇒ 50%	ANTECEDENT MANAGERIAL INTENTION	
	INTANGIBLE	n/a	n/a	n/a	⇒ 60%	↓ 0%	⇒ 63%	↑ 100%	↑ 75%	⇒ 57%		
	HUMAN	n/a	n/a	n/a	⇒ 64%	↑ 100%	↑ 82%	⇒ 58%	↑ 92%	⇒ 57%		
CHANGE TYPE	ADD	↑ 77%	⇒ 60%	⇒ 64%	n/a	n/a	n/a	n/a	↑ 75%	⇒ 61%		
	DELETE	↑ 100%	↓ 0%	↑ 100%	n/a	n/a	n/a	n/a	↑ 100%	↓ 0%		
	MODIFY	⇒ 60%	⇒ 63%	↑ 82%	n/a	n/a	n/a	n/a	↑ 90%	⇒ 60%		
	EXTEND	↓ 0%	↑ 100%	⇒ 58%	n/a	n/a	n/a	n/a	↑ 83%	⇒ 57%		
CLARITY	HIGH	↑ 80%	↑ 75%	↑ 92%	↑ 75%	↑ 100%	↑ 90%	↑ 83%	n/a	n/a		
	LOW	⇒ 50%	⇒ 57%	⇒ 57%	⇒ 61%	↓ 0%	⇒ 60%	⇒ 57%	n/a	n/a		
ATTENTION	HIGH	↑ 86%	⇒ 64%	↑ 100%	↑ 88%	↑ 80%	↑ 83%	⇒ 50%	↑ 92%	↑ 73%		DEPLOYMENT APPROACH
	LOW	⇒ 64%	⇒ 60%	⇒ 59%	⇒ 62%	n/a	⇒ 61%	⇒ 58%	↑ 79%	⇒ 49%		
ENGAGEMENT	HIGH	↑ 80%	↑ 69%	↑ 92%	↑ 77%	n/a	↑ 79%	⇒ 50%	⇒ 57%	↑ 79%		
	LOW	⇒ 64%	⇒ 56%	⇒ 65%	⇒ 62%	↑ 80%	⇒ 56%	⇒ 60%	↑ 90%	↓ 26%		
APPROACH	NON-ROUTINE	⇒ 57%	⇒ 57%	⇒ 50%	⇒ 57%	↑ 67%	↓ 0%	⇒ 60%	⇒ 50%	⇒ 60%		
	ROUTINE	↑ 70%	↓ 29%	⇒ 36%	⇒ 60%	none	⇒ 33%	↓ 30%	↑ 90%	↓ 22%		
	BALANCE	↑ 100%	↑ 76%	↑ 87%	↑ 83%	↑ 100%	↑ 70%	↑ 90%	↑ 90%	↑ 79%		
SOCIETY	EXTERNAL	↑ 75%	⇒ 58%	↑ 100%	↑ 83%	↓ 0%	⇒ 50%	⇒ 50%	↑ 86%	⇒ 58%	STRUCTURAL CONTEXT	
	MANAGERIAL	↑ 69%	↑ 77%	↑ 79%	↑ 67%	↑ 100%	↑ 76%	↑ 86%	↑ 81%	↑ 71%		
	OPERATIONAL	n/a	n/a	⇒ 33%	↓ 0%	↑ 100%	n/a	↓ 0%	↑ 100%	↓ 0%		
	ALL INT	↑ 75%	⇒ 33%	⇒ 55%	⇒ 50%	↑ 100%	⇒ 60%	↓ 25%	↑ 86%	⇒ 36%		
ORG VIEW	FOR	↑ 79%	↑ 81%	↑ 100%	↑ 81%	n/a	↑ 90%	↑ 100%	↑ 88%	↑ 84%		
	AGAINST	↑ 67%	↓ 30%	⇒ 41%	↓ 17%	↑ 80%	⇒ 53%	↓ 0%	↑ 75%	↓ 32%		
	AGNOSTIC	↓ 0%	⇒ 60%	↑ 80%	↓ 0%	n/a	↑ 75%	⇒ 50%	↑ 67%	⇒ 63%		

Key	Visual Indicator Colour
	≤33% - Low Success Rate
	33-67% - Medium Success Rate
	>=67% - High Success Rate

% Success Rate of Antecedent Managerial Intention Factors in Combination with Alternative Factors – Solway Context

		ATTENTION		ENGAGEMENT		APPROACH				
		HIGH	LOW	HIGH	LOW	NON-ROUTINE	ROUTINE	BALANCE		
RESOURCE TYPE	TANGIBLE	7	14	7	14	2	11	23	ANTECEDENT MANAGERIAL INTENTION	
	INTANGIBLE	11	20	13	18	7	7	17		
	HUMAN	9	27	16	20	7	10	4		
CHANGE TYPE	ADD	8	26	13	21	7	15	12		
	DELETE	5	0	0	5	3	0	2		
	MODIFY	12	23	19	16	1	3	10		
	EXTEND	2	12	4	10	5	10	20		
CLARITY	HIGH	12	24	7	29	6	10	20		
	LOW	15	37	29	23	10	18	24		
ATTENTION	HIGH	n/a	n/a	9	18	8	7	12		DEPLOYMENT APPROACH
	LOW	n/a	n/a	27	34	8	21	32		
ENGAGEMENT	HIGH	9	27	n/a	n/a	4	9	23		
	LOW	18	34	n/a	n/a	12	19	21		
APPROACH	NON-ROUTINE	8	8	4	12	n/a	n/a	n/a		
	ROUTINE	7	21	9	19	n/a	n/a	n/a		
	BALANCE	12	32	23	21	n/a	n/a	n/a		
SOCIETY	EXTERNAL	12	7	2	17	7	5	7	STRUCTURAL CONTEXT	
	MANAGERIAL	11	34	24	21	9	11	25		
	OPERATIONAL	1	2	0	3	0	2	1		
	ALL INT	3	18	10	11	0	10	11		
ORG VIEW	FOR	8	36	19	25	7	16	10		
	AGAINST	17	16	13	20	2	1	8		
	AGNOSTIC	2	9	4	7	7	11	26		
SUCCESS	YES	22	37	27	32	9	13	37		OUTCOME
	NO	5	24	9	20	7	15	7		

Counts of Deployment Practice Factor Characterisations in the Solway Case Context

		ATTENTION		ENGAGEMENT		APPROACH			
		HIGH	LOW	HIGH	LOW	NON-ROUTINE	ROUTINE	BALANCE	
RESOURCE TYPE	TANGIBLE	⇒ 26%	⇒ 23%	⇒ 19%	⇒ 27%	↓ 13%	⇒ 39%	↑ 52%	ANTECEDENT MANAGERIAL INTENTION
	INTANGIBLE	⇒ 41%	⇒ 33%	⇒ 36%	⇒ 35%	⇒ 44%	⇒ 25%	⇒ 39%	
	HUMAN	⇒ 33%	⇒ 44%	⇒ 44%	⇒ 38%	⇒ 44%	⇒ 36%	↓ 9%	
CHANGE TYPE	ADD	⇒ 30%	↑ 43%	⇒ 36%	↑ 40%	↑ 44%	↑ 54%	⇒ 27%	
	DELETE	⇒ 19%	↓ 0%	↓ 0%	↓ 10%	⇒ 19%	↓ 0%	↓ 5%	
	MODIFY	↑ 44%	↑ 38%	↑ 53%	⇒ 31%	↓ 6%	↓ 11%	⇒ 23%	
	EXTEND	↓ 7%	⇒ 20%	↓ 11%	⇒ 19%	⇒ 31%	⇒ 36%	↑ 45%	
CLARITY	HIGH	⇒ 44%	⇒ 39%	↓ 19%	⇒ 56%	⇒ 38%	⇒ 36%	⇒ 45%	
	LOW	⇒ 56%	⇒ 61%	↑ 81%	⇒ 44%	⇒ 63%	⇒ 64%	⇒ 55%	
ATTENTION	HIGH	n/a	n/a	⇒ 25%	⇒ 35%	⇒ 50%	⇒ 25%	⇒ 27%	
	LOW	n/a	n/a	↑ 75%	⇒ 65%	⇒ 50%	↑ 75%	⇒ 73%	
ENGAGEMENT	HIGH	⇒ 33%	⇒ 44%	n/a	n/a	⇒ 25%	⇒ 32%	⇒ 52%	
	LOW	⇒ 67%	⇒ 56%	n/a	n/a	↑ 75%	⇒ 68%	⇒ 48%	
APPROACH	NON-ROUTINE	⇒ 30%	↓ 13%	↓ 11%	⇒ 23%	n/a	n/a	n/a	
	ROUTINE	⇒ 26%	⇒ 34%	⇒ 25%	⇒ 37%	n/a	n/a	n/a	
	BALANCE	⇒ 44%	↑ 52%	↑ 64%	⇒ 40%	n/a	n/a	n/a	
SOCIETY	EXTERNAL	↑ 44%	↓ 11%	↓ 6%	⇒ 33%	↑ 44%	⇒ 18%	⇒ 16%	STRUCTURAL CONTEXT
	MANAGERIAL	↑ 41%	↑ 56%	↑ 67%	↑ 40%	↑ 56%	↑ 39%	↑ 57%	
	OPERATIONAL	↓ 4%	↓ 3%	↓ 0%	↓ 6%	↓ 0%	↓ 7%	↓ 2%	
	ALL INT	↓ 11%	⇒ 30%	⇒ 28%	⇒ 21%	↓ 0%	⇒ 36%	⇒ 25%	
ORG VIEW	FOR	⇒ 30%	↑ 59%	↑ 53%	⇒ 48%	⇒ 44%	↑ 57%	⇒ 23%	
	AGAINST	↑ 63%	⇒ 26%	⇒ 36%	⇒ 38%	↓ 13%	↓ 4%	⇒ 18%	
	AGNOSTIC	↓ 7%	↓ 15%	↓ 11%	↓ 13%	⇒ 44%	⇒ 39%	↑ 59%	
SUCCESS	YES	↑ 81%	⇒ 61%	↑ 75%	⇒ 62%	⇒ 56%	⇒ 46%	↑ 84%	OUTCOME
	NO	↓ 19%	⇒ 39%	⇒ 25%	⇒ 38%	⇒ 44%	⇒ 54%	↓ 16%	

Key	The visual indicator colour corresponds to a value of entry in a table cell as determined by the number of options in the vertical category (see appendix 4.3 for further explanation)	2 options	3 options	4 options
		<25%	<16.7%	<12.5%
		25-75%	16.7% - 50%	12.5-37.5%
		>75%	>50%	>37.5%

Solway Context % presence of Deployment Practice Factors by Other Factors (must be read top to bottom and not left to right)

		RESOURCE TYPE			CHANGE TYPE				CLARITY	
		TANGIBLE	INTANGIBLE	HUMAN	ADD	DELETE	MODIFY	EXTEND	HIGH	LOW
SUCCESS RATE		↑ 71%	⇒ 61%	↑ 69%	↑ 68%	↑ 80%	↑ 69%	⇒ 57%	↑ 83%	⇒ 56%
RESOURCE TYPE	TANGIBLE	n/a	n/a	n/a	↑ 77%	↑ 100%	⇒ 60%	↓ 0%	↑ 80%	⇒ 50%
	INTANGIBLE	n/a	n/a	n/a	⇒ 60%	↓ 0%	⇒ 63%	↑ 100%	↑ 75%	⇒ 57%
	HUMAN	n/a	n/a	n/a	⇒ 64%	↑ 100%	↑ 82%	⇒ 58%	↑ 92%	⇒ 57%
CHANGE TYPE	ADD	↑ 77%	⇒ 60%	⇒ 64%	n/a	n/a	n/a	n/a	↑ 75%	⇒ 61%
	DELETE	↑ 100%	↓ 0%	↑ 100%	n/a	n/a	n/a	n/a	↑ 100%	↓ 0%
	MODIFY	⇒ 60%	⇒ 63%	↑ 82%	n/a	n/a	n/a	n/a	↑ 90%	⇒ 60%
	EXTEND	↓ 0%	↑ 100%	⇒ 58%	n/a	n/a	n/a	n/a	↑ 83%	⇒ 57%
CLARITY	HIGH	↑ 80%	↑ 75%	↑ 92%	↑ 75%	↑ 100%	↑ 90%	↑ 83%	n/a	n/a
	LOW	⇒ 50%	⇒ 57%	⇒ 57%	⇒ 61%	↓ 0%	⇒ 60%	⇒ 57%	n/a	n/a
ATTENTION	HIGH	↑ 86%	⇒ 64%	↑ 100%	↑ 88%	↑ 80%	↑ 83%	⇒ 50%	↑ 92%	↑ 73%
	LOW	⇒ 64%	⇒ 60%	⇒ 59%	⇒ 62%	n/a	⇒ 61%	⇒ 58%	↑ 79%	⇒ 49%
ENGAGEMENT	HIGH	↑ 80%	↑ 69%	↑ 92%	↑ 77%	n/a	↑ 79%	⇒ 50%	⇒ 57%	↑ 79%
	LOW	⇒ 64%	⇒ 56%	⇒ 65%	⇒ 62%	↑ 80%	⇒ 56%	⇒ 60%	↑ 90%	↓ 26%
APPROACH	NON-ROUTINE	⇒ 57%	⇒ 57%	⇒ 50%	⇒ 57%	↑ 67%	↓ 0%	⇒ 60%	⇒ 50%	⇒ 60%
	ROUTINE	↑ 70%	↓ 29%	⇒ 36%	⇒ 60%	none	⇒ 33%	↓ 30%	↑ 90%	↓ 22%
	BALANCE	↑ 100%	↑ 76%	↑ 87%	↑ 83%	↑ 100%	↑ 70%	↑ 90%	↑ 90%	↑ 79%
SOCIETY	EXTERNAL	↑ 75%	⇒ 58%	↑ 100%	↑ 83%	↓ 0%	⇒ 50%	⇒ 50%	↑ 86%	⇒ 58%
	MANAGERIAL	↑ 69%	↑ 77%	↑ 79%	↑ 67%	↑ 100%	↑ 76%	↑ 86%	↑ 81%	↑ 71%
	OPERATIONAL	n/a	n/a	⇒ 33%	↓ 0%	↑ 100%	n/a	↓ 0%	↑ 100%	↓ 0%
	ALLINT	↑ 75%	⇒ 33%	⇒ 55%	⇒ 50%	↑ 100%	⇒ 60%	↓ 25%	↑ 86%	⇒ 36%
ORG VIEW	FOR	↑ 79%	↑ 81%	↑ 100%	↑ 81%	n/a	↑ 90%	↑ 100%	↑ 88%	↑ 84%
	AGAINST	↑ 67%	↓ 30%	⇒ 41%	↓ 17%	↑ 80%	⇒ 53%	↓ 0%	↑ 75%	↓ 32%
	AGNOSTIC	↓ 0%	⇒ 60%	↑ 80%	↓ 0%	n/a	↑ 75%	⇒ 50%	↑ 67%	⇒ 63%

Key	Visual Indicator Colour
	≤33% - Low Success Rate
	33-67% - Medium Success Rate
	≥67% - High Success Rate

% Success Rate of Deployment Practice Factors in Combination with Alternative Factors – Solway Context

		STRUCTURE				ORG VIEW				
		EXTERNAL	MANAGERIAL	OPERATIONAL	ALL INT	FOR	AGAINST	AGNOSTIC		
RESOURCE TYPE	TANGIBLE	4	13	0	4	14	6	1	ANTECEDENT MANAGERIAL INTENTION	
	INTANGIBLE	12	13	0	6	16	10	5		
	HUMAN	3	19	3	11	14	17	5		
CHANGE TYPE	ADD	12	15	1	6	27	6	1		
	DELETE	1	2	1	1	0	5	0		
	MODIFY	4	21	0	10	10	17	8		
	EXTEND	2	7	1	4	7	5	2		
CLARITY	HIGH	7	21	1	7	25	8	3		
	LOW	12	24	2	14	19	25	8		
ATTENTION	HIGH	12	11	1	3	8	17	2		DEPLOYMENT APPROACH
	LOW	7	34	2	18	36	16	9		
ENGAGEMENT	HIGH	2	24	0	10	19	13	4		
	LOW	17	21	3	11	25	20	7		
APPROACH	NON-ROUTINE	0	7	9	0	7	2	7		
	ROUTINE	10	5	11	2	16	1	11		
	BALANCE	11	7	25	1	10	8	26		
SOCIETY	EXTERNAL	n/a	n/a	n/a	n/a	12	4	3	STRUCTURAL CONTEXT	
	MANAGERIAL	n/a	n/a	n/a	n/a	27	14	4		
	OPERATIONAL	n/a	n/a	n/a	n/a	0	3	0		
	ALL INT	n/a	n/a	n/a	n/a	5	12	4		
ORG VIEW	FOR	12	27	0	5	n/a	n/a	n/a		
	AGAINST	4	14	3	12	n/a	n/a	n/a		
	AGNOSTIC	3	4	0	4	n/a	n/a	n/a		
SUCCESS	YES	13	34	1	11	38	14	7		OUTCOME
	NO	6	11	2	10	6	19	4		

Counts of Structural Context Factor Characterisations in the Solway

Case Context

		STRUCTURE				ORG VIEW			
		EXTERNAL	MANAGERIAL	OPERATIONAL	ALL INT	FOR	AGAINST	AGNOSTIC	
RESOURCE TYPE	TANGIBLE	⇒ 21%	⇒ 29%	↓ 0%	⇒ 19%	⇒ 32%	⇒ 18%	↓ 9%	ANTECEDENT MANAGERIAL INTENTION
	INTANGIBLE	↑ 63%	⇒ 29%	↓ 0%	⇒ 29%	⇒ 36%	⇒ 30%	⇒ 45%	
	HUMAN	↓ 16%	⇒ 42%	↑ 100%	↑ 52%	⇒ 32%	↑ 52%	⇒ 45%	
CHANGE TYPE	ADD	↑ 63%	⇒ 33%	⇒ 33%	⇒ 29%	↑ 61%	⇒ 18%	↓ 9%	
	DELETE	↓ 5%	↓ 4%	⇒ 33%	↓ 5%	↓ 0%	⇒ 15%	↓ 0%	
	MODIFY	⇒ 21%	↑ 47%	↓ 0%	↑ 48%	⇒ 23%	↑ 52%	↑ 73%	
	EXTEND	↓ 11%	⇒ 16%	⇒ 33%	⇒ 19%	⇒ 16%	⇒ 15%	⇒ 18%	
CLARITY	HIGH	⇒ 37%	⇒ 47%	⇒ 33%	⇒ 33%	⇒ 57%	↓ 24%	⇒ 27%	
	LOW	⇒ 63%	⇒ 53%	⇒ 67%	⇒ 67%	⇒ 43%	↑ 76%	⇒ 73%	
ATTENTION	HIGH	⇒ 63%	↓ 24%	⇒ 33%	↓ 14%	↓ 18%	⇒ 52%	↓ 18%	
	LOW	⇒ 37%	↑ 76%	⇒ 67%	↑ 86%	↑ 82%	⇒ 48%	↑ 82%	
ENGAGEMENT	HIGH	↓ 11%	⇒ 53%	↓ 0%	⇒ 48%	⇒ 43%	⇒ 39%	⇒ 36%	
	LOW	↑ 89%	⇒ 47%	↑ 100%	⇒ 52%	⇒ 57%	⇒ 61%	⇒ 64%	
APPROACH	NON-ROUTINE	↓ 0%	⇒ 37%	⇒ 20%	↓ 0%	⇒ 21%	⇒ 18%	↓ 16%	
	ROUTINE	⇒ 48%	⇒ 26%	⇒ 24%	↑ 67%	⇒ 48%	↓ 9%	⇒ 25%	
	BALANCE	↑ 52%	⇒ 37%	↑ 56%	⇒ 33%	⇒ 30%	↑ 73%	↑ 59%	
SOCIETY	EXTERNAL	n/a	n/a	n/a	n/a	⇒ 27%	↓ 12%	⇒ 27%	STRUCTURAL CONTEXT
	MANAGERIAL	n/a	n/a	n/a	n/a	↑ 61%	↑ 42%	⇒ 36%	
	OPERATIONAL	n/a	n/a	n/a	n/a	↓ 0%	↓ 9%	↓ 0%	
	ALL INT	n/a	n/a	n/a	n/a	↓ 11%	⇒ 36%	⇒ 36%	
ORG VIEW	FOR	↑ 63%	↑ 60%	↓ 0%	⇒ 24%	n/a	n/a	n/a	
	AGAINST	⇒ 21%	⇒ 31%	↑ 100%	↑ 57%	n/a	n/a	n/a	
	AGNOSTIC	↓ 16%	↓ 9%	↓ 0%	⇒ 19%	n/a	n/a	n/a	
SUCCESS	YES	⇒ 68%	↑ 76%	⇒ 33%	⇒ 52%	↑ 86%	⇒ 42%	⇒ 64%	OUTCOME
	NO	⇒ 32%	↓ 24%	⇒ 67%	⇒ 48%	↓ 14%	⇒ 58%	⇒ 36%	

Key	The visual indicator colour corresponds to a value of entry in a table cell as determined by the number of options in the vertical category (see appendix 4.3 for further explanation)	2 options	3 options	4 options
		<25%	<16.7%	<12.5%
		25-75%	16.7% - 50%	12.5-37.5%
		>75%	>50%	>37.5%

Solway Context % presence of Structural Context Factors by Other Factors (must be read top to bottom and not left to right)

		STRUCTURE				ORG VIEW		
		EXTERNAL	MANAGERIAL	OPERATIONAL	ALL INT	FOR	AGAINST	AGNOSTIC
SUCCESS RATE		↑ 68%	↑ 76%	⇒ 33%	⇒ 52%	↑ 86%	⇒ 42%	⇒ 64%
RESOURCE TYPE	TANGIBLE	↑ 75%	↑ 69%	n/a	↑ 75%	↑ 79%	↑ 67%	↓ 0%
	INTANGIBLE	⇒ 58%	↑ 77%	n/a	⇒ 33%	↑ 81%	↓ 30%	⇒ 60%
	HUMAN	↑ 100%	↑ 79%	⇒ 33%	⇒ 55%	↑ 100%	⇒ 41%	↑ 80%
CHANGE TYPE	ADD	↑ 83%	↑ 67%	↓ 0%	⇒ 50%	↑ 81%	↓ 17%	↓ 0%
	DELETE	↓ 0%	↑ 100%	↑ 100%	↑ 100%	n/a	↑ 80%	n/a
	MODIFY	⇒ 50%	↑ 76%	n/a	⇒ 60%	↑ 90%	⇒ 53%	↑ 75%
	EXTEND	⇒ 50%	↑ 86%	↓ 0%	↓ 25%	↑ 100%	↓ 0%	⇒ 50%
CLARITY	HIGH	↑ 86%	↑ 81%	↑ 100%	↑ 86%	↑ 88%	↑ 75%	↑ 67%
	LOW	⇒ 58%	↑ 71%	↓ 0%	⇒ 36%	↑ 84%	↓ 32%	⇒ 63%
ATTENTION	HIGH	⇒ 58%	↑ 100%	↑ 100%	↑ 100%	↑ 100%	↑ 76%	⇒ 50%
	LOW	↑ 86%	↑ 68%	↓ 0%	⇒ 44%	↑ 83%	↓ 6%	↑ 67%
ENGAGEMENT	HIGH	↑ 100%	↑ 75%	n/a	↑ 70%	↑ 89%	⇒ 62%	⇒ 50%
	LOW	⇒ 65%	↑ 76%	⇒ 33%	⇒ 36%	↑ 84%	↓ 30%	↑ 71%
APPROACH	NON-ROUTINE	⇒ 43%	↑ 67%	none	none	⇒ 57%	⇒ 43%	↑ 100%
	ROUTINE	↑ 80%	⇒ 55%	↓ 0%	↓ 30%	↑ 91%	↓ 19%	↓ 0%
	BALANCE	↑ 86%	↑ 88%	↑ 100%	↑ 73%	↑ 92%	↑ 80%	⇒ 63%
SOCIETY	EXTERNAL	n/a	n/a	n/a	n/a	↑ 92%	↓ 0%	↑ 67%
	MANAGERIAL	n/a	n/a	n/a	n/a	↑ 81%	⇒ 64%	↑ 75%
	OPERATIONAL	n/a	n/a	n/a	n/a	n/a	⇒ 33%	n/a
	ALL INT	n/a	n/a	n/a	n/a	↑ 100%	⇒ 33%	⇒ 50%
ORG VIEW	FOR	↑ 92%	↑ 81%	n/a	↑ 100%	n/a	n/a	n/a
	AGAINST	↓ 0%	⇒ 64%	⇒ 33%	⇒ 33%	n/a	n/a	n/a
	AGNOSTIC	↑ 67%	↑ 75%	n/a	⇒ 50%	n/a	n/a	n/a

Key	Visual Indicator Colour
	≤33% - Low Success Rate
	33-67% - Medium Success Rate
	≥67% - High Success Rate

% Success Rate of Structural Context Factors in Combination with Alternative Factors – Solway Context