THE IMPACT OF BUSINESS MODEL ON INNOVATION PERFORMANCE

Chia-Hao, Chou

Strathclyde University

Marketing department

Thesis submitted in accordance with the requirements for the

Degree of Doctor of Philosophy

2023 November

Declaration of Authenticity and Author's Rights

Signed:

Date: 10/ /2023

Acknowledgements

This journey has been long, with its ups and downs, and I want to express my gratitude to the people who supported me along the way.

First and foremost, I am grateful for the blessing from God. Despite facing difficult times, including the passing of my grandmother, the birth of my third child during a challenging financial situation, and the worldwide spread of covid, help always arrived to allow me to continue my research.

I am also thankful to my family. My mother Grace has been a role model of persistence, and my wife Janice has shown incredible adaptability while taking care of all five of us.

Special thanks to my supervisor Prof. Spiros Gounaris, who accepted me for this PhD and provided valuable insights to enhance my academic and personal growth. I am also grateful to my second supervisor Dr Juliette Wilson for her support and belief in my capabilities. Dr. Ebede's help regarding academic writing is exceptional as well.

Finally, I dedicate this work to my three wonderful children: Isaac, Amelia, and Audrey. May this thesis serve as a source of encouragement for all your future journeys in life.

Thank you all.

Abstract

Innovation drives business performance, but effective value capture through a business model is essential. This thesis explores how managers can use their business model to enhance technology innovation performance and achieve sustainable competitive advantage.

The research findings reveal the relationship between business model configuration and value capture from technological innovation. These insights show how business models can vary and impact a company's performance, enabling them to constantly outperform competitors by transforming technology innovation into different outcomes.

A mixed method was employed to explore what gives a company a competitive advantage in developing successful innovations. Specifically, a scale was developed for capabilities, resources, and activities, and questionnaires from 228 high-technology strategy makers were utilised.

The study findings disclose the important characteristics of the innovation product business model: internal compatibility, constant innovation, and external adaptability. The research identifies various business model configurations that enable value capture from technological innovation, benefiting academics and managers.

The research significantly contributes by exploring the dynamic nature of innovation performance business models and their profound impact on innovation performance. It offers actionable insights into how strategic decision-makers can innovate their business models to capture value from new products. Additionally, the study uncovers the relationship between organizational culture, structure, and business models. By examining radical and incremental innovation in both UK and TW regions, it provides valuable insights for companies seeking sustainable competitive advantage through business model innovation.

In conclusion, the study shifts the perspective of the business model from being a mediator between technological input and economic output to an enabler in transforming technological innovation into a company's competitive advantage. This knowledge empowers strategy makers to optimise their business models and achieve sustainable competitive advantage through continuous innovation.

Table of contents

List of Tables

List of Figures

Chapter One: Introduction

This chapter describes how business model facilitates innovation performance and how organisational culture and structure affect the business model innovation and implementation. It first presents the research's theoretical background to depict the motivation, the academic context, and the underpinning theory of this study. Then the research gap and the questions are identified, where the theoretical propositions, aims and objectives are elucidated accordingly. Subsequently, the research framework is introduced, and the research method elaborates on how the investigation is administered. Finally, the chapter closes by outlining the structure of the thesis containing a brief description of each part.

1.1 Theoretical background

An important question in the business strategy literature is why some companies perform better than others (Day, 1994, Porter, 1985, Barney, 1991, Christensen, 1997, Christensen, 2001, Mitchell and Coles, 2003, Afuah, 2004, Markides and Geroski, 2004, Purkayastha and Sharma, 2016, Kuncoro and Suriani, 2018). In response, scholars have explored different sources of competitive advantage from various theoretical perspectives to accommodate different market conditions. In mature and relatively stable environments, companies compete on cost, quality, and customer service to gain a competitive edge. The two theories that are most relevant in this context are Michael Porter's Five Forces Model and the Resource-Based View of the firm. Porter's Five Forces Model focuses on the external factors affecting a firm's competitiveness in a given market, including the bargaining power of buyers and suppliers, the threat of new entrants and substitutes, and the level and intensity of competitive rivalry (Porter, 1985). In contrast, The Resource-Based View (RBV) focuses on the internal factors that a firm can leverage to achieve a competitive advantage. This theory suggests that a firm's unique resources and capabilities, such as proprietary technology, brand reputation, and talented employees, can provide a sustainable competitive advantage if they are difficult for competitors to imitate or acquire (Barney, 1991, Barney, 2001b). Therefore, to achieve a sustainable competitive advantage in a mature, stable market, companies must balance their focus on both external and internal factors. They must understand the competitive forces they face and find ways to differentiate themselves by constantly leveraging their unique resources and capabilities.

When technology changes are frequent, competition remains fluid and/or hard to predict. Thus, how a firm remains competitive in a market has always been the concern of strategy makers (CEO/COO/Founder/High-level manager etc.). The RBV theory suggests that a firm's resources, capabilities, and competencies can provide a sustained competitive advantage if they are valuable, rare, inimitable, and non-substitutable. In a rapidly changing technology environment, firms with unique resources, such as specialized knowledge, skilled human capital, and proprietary technology, may be better positioned to adapt to change and maintain a competitive advantage (Kim and Mauborgne, 1997, Jay Barneya et al., 2001).

On the contrary, the Dynamic Capabilities (DC) perspectives emphasizes that a firm's sustainable competitive advantage is not solely determined by its existing resources, but also by its ability to continuously create, integrate, and renew its resources and

capabilities over time. In a rapidly changing technology landscape, firms with strong dynamic capabilities are more likely to identify new opportunities, respond to new threats, and innovate to remain competitive (Teece, 1997, Teece, 2007, Teece, 2010b). Therefore, a firm's competitive advantage derives from the development (or employment) of its resources to perform the purposeful activities for reaching its unique market position (Barney, 1991, Barney, 2001b, Teece, 2010b, Teece, 2018b, DeSarbo et al., 2005, Julienti Abu Bakar and Ahmad, 2010).

Another factor in building or enhancing a firm's competitive advantage is the adoption of innovation, which can help create and deliver value to meet or even exceed the customer's expectations (Narver et al., 2004). However, when an technological innovation is developed by a firm to differentiate itself from its competitors, the way to turn it into economic returns is still under discussion, which means technological innovation not necessarily leads the enhancement of a company's competitive advantage (Casadesus-Masanell and Ricart, 2010, Casadesus-Masanell and Zhu, 2013, Sun and Liu, 2020, Lanzolla and Markides, 2020).

In present time's reality, most companies are more likely to face such dynamic market conditions and environments. Primarily but not exclusively, technology together with the cumulation of such resources as monetary capital or human capital has fuelled competition, while blurring the lines between sectors and "competitors" (Davcik and Sharma, 2016, Rifat, 2017, Pan et al., 2017). Amazon -for example- started as an online bookseller with an initial capital of $250k before evolving into a major conglomerate of strategic business units competing in sectors ranging from retailing (with such a diversified and wide assortment that "traditional" retailers can hardly match or compete), film production and distribution, to design and development of high-tech software and products, including for example "Alexa" and its compatible products (from surveillance cameras to speakers and wearables) that Amazon also offers. Companies in more traditional sectors, such as banking for instance, have also seen the demarcation of their sector's lines. Car manufacturers, such as the VolksWagen group or FIAT as well as supermarkets, such as TESCO or Sainsbury have all built upon the access to cash their business generates to enter the financial services sector. They offer different financial products targeting their existing customers, but they also compete against the "established" financial services providers for new customers. The cases are many really, all of them attesting to the fact that since 2000s and onwards competition in -any- market is increasingly becoming less predictable and less stable. By implication, investigating and understanding the sources of competitive advantage under dynamic market conditions becomes, clearly, a lot more relevant.

However, many companies face a challenge when they prioritize developing new technological innovations without considering how to turn these innovations into profitable products that meet market demand. As a result, many of these companies fail because they overlook the importance of creating market value and delivering the product to the customer (Chesbrough and Rosenbloom, 2002, Chesbrough, 2007, Teece, 1986, Baden-Fuller and Haefliger, 2013). Otherwise stated, innovation is important for business performance, but focusing only on product innovation cannot secure companies' success in the marketplace (Deshpandé and Farley, 2004, Liu and Buck, 2007, Christensen, 1997, Markides and Geroski, 2004, Chesbrough, 2004, Narver et al., 2004, Teece, 2006, Baden-Fuller and Haefliger, 2013). This means it is important for companies to balance their focus on technological innovation with a consideration on creating value for the customer and delivering the product to them (Teece, 2010a, Zott and Amit, 2010, Zott and Amit, 2012, Baden-Fuller and Morgan, 2010, Johnson et al., 2008, Hu and Chen, 2016, Snihur, 2018, Sun and Liu, 2020). One way to do this is to rely on the company's business model, which is the way the company configure its resources and activities to commercialize the technological innovation and benefit the company (Afuah and Tucci, 2001, Achtenhagen et al., 2013, Rosenbloom, 2002, Teece, 2006).

While research has identified factors that contribute to securing business success through sustainable competitive advantage, no single factor can guarantee success on its own. The way a company combines these factors is equally important. Recently, scholars have focused on the purpose, framing, and composition of a company's business model (Johnson et al., 2008, Richardson, 2008, Zott and Amit, 2009, Zott and Amit, 2012)

In terms of the discussion of multiple business models, a key question is what motivates a firm to adopt a particular business model. Scholars have defined a business model as a configuration of factors that contribute to sustainable competitive advantage (Markides and Sosa, 2013, Kim and Min, 2015, Waghmare and Golhar, 2017, Schneider, 2019, Sousa-Zomer and Cauchick Miguel, 2018). Specifically, a business model is the way in which a company combines its resources, capabilities, and activities to achieve its strategic objectives in the face of market conditions.

In 1998, Timmers provided a definition of a business model as a framework that outlines how a company generates revenue by exploring the value created and delivered in their product, information, and services. To further clarify this concept, Timmers identified eleven types of business models, including e-shop, e-procurement,

and e-auction, each with a specific approach to generating profit. This definition and the various business model types illustrate the importance of a company's chosen focus in competing in the market. Essentially, a company's chosen business model indicates how they plan to differentiate themselves from their competitors and generate revenue in the process.

Amit and Zott (2001) define a business model as the method by which a company organizes and manages its transactions to generate value. They suggest four potential sources of profitability and introduce four corresponding business models: Efficiency, Novelty, Lock-in, and Complimentary. Primally, a business model serves as a roadmap for companies to navigate their current position within a business network, and the specific type of business model chosen can greatly influence how a company overcomes the existing barriers to profitability.

The business model plays a crucial role in enhancing a company's competitive advantage through innovation. This is achieved by focusing on two strategic objectives: facilitating the performance of innovative products and keeping the company's business approach dynamic to adapt to environmental changes. The business model allows companies to remain competitive by identifying how value can be continuously created to the market (Amit and Zott, 2001).

Some studies explore the role of the business model in commercializing developed innovation (Teece, 2010a, Chesbrough and Rosenbloom, 2002, Teece and Linden, 2017, Baden-Fuller and Haefliger, 2013, Casadesus-Masanell and Zhu, 2013), while others focus on the importance of reconfiguring its content elements to adapt to market challenges (Zott and Amit, 2012, Johnson et al., 2008, Richardson, 2008, Sun and Liu, 2020, Schneider, 2019). These discussions form the foundation of the business model framework as value creation, delivery, and creation (Johnson et al., 2008, Richardson, 2008, Zott and Amit, 2009, Bengtsson, 2018).

However, the composition of the business model remains vague, particularly for managers who need to constantly reconfigure their business model content elements to remain dynamic and respond to environmental changes (Kim and Min, 2015, Philipson, 2016, Velu, 2016, Foss and Saebi, 2016). Meanwhile, high technology firms that focus on new product development face the challenge of acquiring new business model components and/or reallocating current ones to enhance their competitive advantage and benefit the company (Zott et al., 2011, Achtenhagen et al., 2013, Foss and Saebi, 2016, Demil and Lecocq, 2010).

In addition to developing and implementing a business model, the literature has also highlighted the importance of considering organisational culture and structure. Organisational culture, viewed through the Resource-Based View (RBV), is seen as an asset that enables companies to acquire the necessary capabilities and resources to perform their activities in a unique way (Barney, 1986, Fiol, 1991). On the other hand, organisational structure governs the interactions among business model elements (ex. Product innovation, strategy innovation) to better secure the performance of technological innovations (Chen and Fung, 2013, Damanpour and Gopalakrishnan, 1998). Organisational culture and structure are related to creating competitive advantage through innovation (Butlin, 2001, Gürlek and Tuna, 2017, Daft, 1978, Daugherty et al., 2011). However, while the impact of organisational culture and structure on business performance and resource management has been extensively studied, there is a lack of literature that explores their influence on the business model itself.

To enhance a firm's competitive advantage with innovation, it's crucial to have a unique configuration of pertinent capabilities, resources, and activities in the business model (Chesbrough, 2010, Teece, 2010a, Amit and Zott, 2015, Schneider, 2019, Sun and Liu, 2020). However, the literature hasn't provided specific details about which business elements should be combined to achieve this goal. Therefore, the key question is how a firm can structure its business model to maximize the performance of its technological innovation.

Accordingly, it is important to note that the success of a firm in a dynamic environment requires both resources and dynamic capabilities, as well as effective management of their interplay to implement activities (Casadesus-Masanell and Ricart, 2010). Hence, *a business model is a strategic choice a company makes to configure and use pertinent capabilities, resources and activities to compete in the marketplace* (Afuah, 2004, Teece, 2010a, Zott and Amit, 2012, Magretta, 2002).

1.2 The business-model literature and research gaps

Existing studies on business models have primarily examined their purpose, framework, and composition, focusing on "what" makes a business model enhance a company's competitive advantage. However, when exploring "how" a business model facilitates technological innovation performance through value creation, delivery, and capture, the current discussion has mainly centered on value creation and delivery. Instead, the aspect of value capture in relation to technological innovation performance is a noticeable absence of research deserves further attention and investigation dealing with what business model (or models) contributes to value capture. (Amit and Zott, 2001, Amit and Zott, 2002, Atuahene-Gima et al., 2005, DP Lepak, 2007, Olsson and Larsson, 2009, Zhang et al., 2016, Teece and Linden, 2017)

Recent studies on business model design and innovation have shown that different business models lead to different outcomes (Chesbrough, 2010, Zott and Amit, 2010, Zott and Amit, 2012, Bengtsson, 2018). However, it remains unclear how companies can perform differently in their markets. The existing literature lacks a comprehensive explanation of how managers can use business models to continuously enhance their competitive advantage, particularly regarding the method of value capture. Therefore, by following the research aim (uncover the hidden sources of sustainable competitive advantage), this study first clarifies “what” (configuration) the business model can facilitate the technology innovation performance. Subsequently “how” the business model operates to generate different outcomes. Lastly explaining “why” the business model can be innovated for managers to develop companies’ sustainable competitive advantage in consistent to the research aim. Stated differently, the research finding means to help manager to frame, structure and innovate their business models to achieve profitability for their companies consistently.

The composition of business model elements plays a crucial role in how a company stands out and competes in the market. This aligns with the Resource-Based View (RBV) and Dynamic Capabilities (DC) perspective, which emphasizes the value, rarity, imitability, and substitutability of resources for creating a competitive advantage (Barney, 1991, Teece, 1997, Afuah, 2004, Teece, 2010a). However, the current understanding of the business model construct is limited in analyzing how business model configuration impacts technological innovation performance, as few studies have explored the composition and purposes of different business models. Some critics argue that RBV and DC perspectives oversimplify the role of resources in competitive advantage and neglect the dynamic and contextual aspects of innovation and

entrepreneurship (Foss and Saebi, 2016, Hutchinson et al., 2021).

To address this gap, some attempts have been made to categorize or compare different business models based on their characteristics or functions (Chesbrough and Rosenbloom, 2002, Demil and Lecocq, 2010). Additionally, the relationship between business model configuration and innovation performance may vary depending on the innovation process stage, type of innovation (incremental vs. radical), or level of industry disruption (Markides, 2013, Chesbrough, 2020)

The composition of business model elements determines how a company differentiates itself and competes with other rivals in the market. This notion fits into the RBV and DC perspective suggesting that the valuable, rare, imperfectly imitated and unsubstituted (VRIN) resources enable a company to perform its intended activities, and create the competitive advantage (Barney, 1991, Teece, 1997, Afuah, 2004, Teece, 2010a). However, the addressed business model construct is inadequate to further analyse how the business model configuration affects technological innovation performance since very few studies have elucidated upon the composition of different business models and their purposes. For instance, some scholars have criticized the RBV and DC perspectives for oversimplifying the role of resources in creating competitive advantage and ignoring the dynamic and contextual aspects of innovation and entrepreneurship (Foss and Saebi, 2016, Hutchinson et al., 2021). In addition, there have been some attempts to categorize or compare different types of business models based on their characteristics or functions (Chesbrough and Rosenbloom, 2002, Demil and Lecocq, 2010). Moreover, the relationship between business model configuration and innovation performance may also depend on the stage of the innovation process, the type of innovation (incremental vs. radical), or the level of industry disruption (Markides, 2013, Chesbrough, 2020).

These discussions addressed the interplay between business model configuration, technological innovation performance and competitive advantage. In short, there are many different factors that make up a business model, and by choosing the right ones, companies can ensure that they are creating and delivering value to their customers, which will lead to successful value capture for the company (Foss and Saebi, 2016).
The research indicates that for a company to successfully capture value from its innovations, managers must consider specific factors. These factors include implementing new revenue models and cost structures that are optimized to maximize the value derived from the innovation (Clauss, 2016). New revenue models are essential for capturing the value of an innovation. This involves finding new ways to

generate revenue from the innovation that is not just limited to traditional sales channels. For example, a company may introduce subscription-based models or freemium models that offer basic services for free and charge for premium services. Alternatively, a company may monetize user data or develop new revenue streams through partnerships or licensing agreements (Teece, 2010a, Casadesus-Masanell and Ricart, 2010). On the other hands, Cost structures are also important for capturing the value of innovation. A company must ensure that its cost structure is optimized to support innovation and generate profits. This may involve reducing costs through outsourcing or automation, or developing new partnerships to reduce costs and increase efficiency (Johnson et al., 2008, Teece, 2010a). Meanwhile, the multiple case studies showed that even a similar product (ex. mobile phone, laptop, search engine) will generate different outcomes when it works in alliance with various business models. (Teece, 2010a, Chesbrough and Rosenbloom, 2002, Zott and Amit, 2012, Baden-Fuller and Haefliger, 2013).

Various business model frameworks exist to identify the business model that improves innovation performance. These frameworks assist companies in identifying areas within their current business model that can be innovated for better performance (Johnson et al., 2008, Richardson, 2008, Clauss, 2016, Mitchell and Coles, 2003, Casadesus-Masanell and Zhu, 2013, Teece, 2010a). However, the current understanding of the business model construct is inadequate in explaining the composition and purposes of different business models. The lack of identification of content elements and their interactions further limits our comprehension of how it work as an mechanical system (Geissdoerfer et al., 2018, Wirtz et al., 2016).

By answering these questions, managers can better understand how the design and implementation of a business model configuration affect innovation performance, enabling their companies to remain competitive in a dynamic market. By following the research aim, the study findings mean to clarify how a business model functions as an activities system to constantly transform technological innovation into desired outcomes to capture value as the source of sustainable competitive advantage (Chesbrough and Rosenbloom 2002, Zott and Amit, 2010, Zott and Amit, 2013). This topic has been underexplored in previous studies, and this research seeks to fill this knowledge gap.

In addition, apart from the exogenous drivers and reconfiguration of endogenous elements, the impact from organisational culture and organisational structure towards the business model has been addressed but not further depicted (Foss and Saebi, 2016).

Different organisational cultures and structures refer to various ways of constituting a firm's resources and governing the performance of the intended activities within the business model architecture. However, when centring around the innovation performance, their interactions towards the business model and each other remain fuzzy.

Despite the attempt to explore the relationship between organisational culture and business model implementation underpinned by the RBV and DC perspective (Barney, 1986, Fiol, 1991, Chirico and Nordqvist, 2010), the current literature has not presented what organisational culture elements affect the design/innovation of business models. Likewise, what organisational structure elements can help managers to govern resource and capability flows (Chen and Fung, 2013) to perform various activities still needs further studies for companies to enhance their competitive advantage (Danupol Hoonsopon, 2012, Dekoulou and Trivellas, 2017, Hsiao and Wu, 2020). Moreover, the interactions between organisational culture, structure and business model have been rarely discussed in the literature.

1.3 Research aim and objectives

The aim of this thesis is to study how companies can apply their business model to develop a sustainable competitive advantage in modern markets. As technological innovation alone may not guarantee success, companies need more to strategically differentiate themselves. The business model is a source of competitive advantage that reflects a company's strategic choices to stand out, but it remains unclear how to configure the business model to enhance innovation performance.

The following objectives will serve this thesis' aim:

1. Identify the architecture of a company's innovation performance business model in terms of its resources, capabilities, and activities in the market.
2. Examine the diversity of business model configurations for various types of innovation performance
3. Investigate how the arrangement of resources, capabilities, and activities in a business model affects a company's ability to remain competitive by capitalizing on the value of their technological innovations in the market.
4. Examine the impact of organisational culture and structure ON THE COMPANY'S business model for innovation performance.

To achieve the above-mentioned research objectives, this research makes several important contributions to the literature and offers practical applications for managers seeking to enhance their innovation performance through business model configuration. In essence, the contributions offering a deep understanding of what constitutes an innovation performance business model, how it can be operated and innovated, and why it serves as a crucial source of sustainable competitive advantage in today's dynamic business landscape.

Firstly, the study explores the critical elements that impact a company's business model configuration and investigates the heterogeneity of business models for innovation performance. The findings shed light on identifying the different types of business models and explain that companies can adopt different business models and the purposes they serve in driving innovation to reach their strategic goals. In brief, the study contributes to understanding the relationship between business model configuration and innovation performance, which unfolds the business model composition that has been addressed but has yet to be analyzed.

Secondly, the study examines how companies can effectively configure the critical elements of their business model to enhance their innovation performance. Additionally, the study explores the potential impact of business model configuration on sustainable competitive advantage. The study's results provide a deep and thorough understanding of how the design of a business model can affect a firm's ability to consistently achieve its strategic and performance goals. These findings fill a gap in the literature by providing further clarification on how a business model can create value and contribute to a firm's sustainable competitive advantage.

Thirdly, the study examines the impact of organizational culture and structure towards business model for innovation performance, offering practical recommendations for firms seeking to foster a culture of innovation and develop a flexible, adaptive organizational structure that supports effective business model design. This contribution offers significant value to both academics and practitioners, providing valuable insights into the complex interplay between business model configuration, organisational culture, organisational structure, innovation performance.

The fourth contribution of this research aims to address the practical challenge of how managers can make their business model successful in a dynamic environment. While the existing literature has proposed a framework that combines business model assortment and innovation with a company's strategic choice, it lacks clear guidance on where and how managers can put effort into evolving or changing their business model to achieve success. The study's findings provide a business model roadmap that allows companies to construct their business model with strategic thinking and make key decisions to take action. In other words, the research helps managers to identify critical sections to invest in or assess the cost of changing their business model to enhance a company's sustainable competitive advantage. This practical application of the research findings can be particularly valuable for managers facing the challenge of adapting their business model in response to changes in the market or competitive landscape.

Hence, by examining the objectives and the heterogeneity of innovation performance business models and their implications for innovation performance, this research makes significant strides toward achieving its aim. Furthermore, it delves into the influence of organizational culture and structure on these business models. What distinguishes this study is its comprehensive approach, which encompasses an analysis of two distinct types of innovation—radical and incremental—in two geographically diverse regions, the UK and TW (Taiwan).

Overall, this study aims to provide valuable insights tailored to varied contexts and contribute to a comprehensive understanding of innovation performance business models, their configuration and operation of achieving value capture, and their role empowering companies with practical strategies for attaining sustainable competitive advantage.

1.4 Structure of the thesis

This section describes the structure of the current thesis.

Chapter two focuses on reviewing the literature related to business model(s), innovation performance, organisational culture, and structure. Particularly, the resource-based view (RBV) and dynamic capabilities (DC) perspective are used to underpin the development of this thesis. The importance of exploring the relationship between business models, innovation performance, organisational culture and structure is highlighted. A critical assessment of the existing literature provides the foundation to develop a working definition of the business model, leading to the formation of the model.

Chapter three is concerned with the development of the model construct. The relevant concepts discussed in the previous chapter are elaborated and integrated hereby. By exploring the objectives' potential links, the hypothesis is established to construct the research instrument.

The research methodology and design are elucidated in Chapter four. This begins by introducing the research paradigm and then the research method. Then the development of the research design is elaborated and explained. The formation of the research instrument is given at the end of this section.

Chapter five presents the process, framework, and analysis of the qualitative research. The formation of the interview guide and the expectation of the researcher are elaborated in the beginning. The interview procedure gives the details of the investigation. The result presented at the end aims to start the subsequent analysis.

The interview results are analysed in Chapter six. The findings are used to form the context for the second phase quantitative research, and the hypothesis is strengthened by the relevant data.

Chapter 7 elaborates upon the process of transferring the stage I data into the stage II research instrument. Designing the questionnaire was faced with a few challenges in terms of time constraints. The process of data collection was under pressure because the participants lived in two different regions of the world and reaching them was not easy. Finally, further analysis will confirm this research's validity and reliability.

In Chapter 8, the quantitative research results are analysed by adopting the descriptive statistics and PLS-SEM method. The results are in the content associated with the statistical approach. Fifteen PLS models emerge, and their discrepancy are disclosed in the group analysis.

Finally, Chapter 9 presents the findings derived from the research and examines the implications related to the initial research aim. Theoretical and managemental contributions are presented separately. The limitations and recommendations that emerge from this research are also addressed.

Chapter Two Literature Review

This chapter will offer an insight into the known literature that has contributed to research on performance variations among firms. Relevant theories will be used to guide the discussion in trying to understand why some companies have a competitive advantage over others in similar and/or different market conditions. Special emphasis will be put on how successful companies, in order to keep their competitive advantage, can balance both external and internal factors, while constantly leveraging their unique resources and capabilities.

Speaking of the ability to leverage unique resources and capabilities, a thorough review of the literature will reveal that the adoption of innovation can help a firm build its competitive advantage and create and deliver value to meet or even exceed the customer's expectations. However, it will also be argued that innovation alone is not enough if there is not a clear path to show how to turn it into economic returns. This shortcoming will lead to the discussion on the exploration of value creation as a possible solution.

Next, the discussion will move to the examination of the role of business model in ensuring a firm's competitive advantage, while trying to put all the elements, players, and drivers in a perfect musical symphony. But since there is not an agreed upon definition of what a business model is, we will review their different definitions that have been used so far and then propose a working definition that would lay the foundations for the development of the conceptual model. Moreover, this working definition will address the direction of this research to shed light on how business model is configured so that it can contribute to sustainable competitive advantage.

Finally, the current chapter will close with an analysis of the importance of organisational culture and structure as they relate to the business model. The lack of explanation of how organisational culture elements can affect the design/innovation of business models coupled with the insufficient explication of how organisational structure elements can help managers to govern resources and capabilities observed in the literature justify the need to create a more comprehensive, flexible, and adaptable business model proposed in this thesis.

2.1. Performance variation among firms

Trying to understand why some companies perform better than others has been scholars' preoccupation for a long time (Day, 1994, Porter, 1985, Barney, 1991, Christensen, 1997, Christensen, 2001, Mitchell and Coles, 2003, Afuah, 2004, Markides and Geroski, 2004, Purkayastha and Sharma, 2016, Kuncoro and Suriani, 2018). In an attempt to answer this question, different theoretical perspectives have been explored. In this chapter, we will look at three of the most relevant theories: Porter's Five Forces Model, The Resource-Based View (RBV), and The Dynamic Capabilities (DC).

2.1.1. Porter's Five Forces Model

In 1979, Harvard Business School professor Michael E. Porter created a framework to analyze a company's competitive environment. The framework has since been known as Porter's Five Forces Model, which is frequently used by managers as guidelines to evaluate the competitive forces that influence a variety of business sectors. These forces include the number and power of a company's competitive rivals, potential new market entrants, suppliers, customers, and substitute products that influence a company's profitability. Porter (1990) argued that companies gain advantage against the world's best competitors because of pressure and challenge. In other words, the fear of loss often proves more powerful than the hope of gain.

Porter (1990) went on to argue against the prevailing theory that described labor costs, interest rates, exchange rates, and economies of scale as the most potent determinants of competitiveness. Instead, he suggested that competitive advantage is created and sustained through a highly localized process. Differences in national values, culture, economic structures, institutions, and histories all contribute to competitive success (Porter, 1990). In short, Porter's Five Forces Model focuses on the external factors affecting a firm's competitiveness in a given market, including the bargaining power of buyers and suppliers, the threat of new entrants and substitutes, and the level and intensity of competitive rivalry (Porter, 1985). Such a model alone cannot explain performance variation amongst firms, since to achieve a sustainable competitive advantage in a mature, stable market, companies must balance their focus on both external and internal factors. They must understand the competitive forces they face and find ways to differentiate themselves by constantly leveraging their unique resources and capabilities. Still, Porter (1990) makes a strong contribution when he argues that a nation's competitiveness depends on the capacity of its industry to

innovate and upgrade, because companies achieve competitive advantage through acts of innovation.

2.1.2. The Resource-Based View (RBV)

Unlike Porter's Five Forces Model, which focuses on external factors affecting a firm's competitiveness, the Resource-Based View (RBV) focuses on the internal factors that a firm can leverage to achieve a competitive advantage. This theory suggests that a firm's unique resources and capabilities, such as proprietary technology, brand reputation, and talented employees, can provide a sustainable competitive advantage if they are difficult for competitors to imitate or acquire (Barney, 1991, Barney, 2001b). Stated differently, the RBV theory argues that a firm's resources, capabilities, and competencies can provide a sustained competitive advantage if they are valuable, rare, inimitable, and non-substitutable.

It is important to note that we are using RBV here in its broader sense, purposefully overlooking its internal controversies because what is relevant to our thesis is to understand that the resource-based view can be applied in several different ways, and that the way it should be applied depends mostly on the empirical context of the application (Barney, 2001). As a brief reminder, the resource-based view can be positioned relative to at least three theoretical traditions: SCP-based theories of industry determinants of firm performance, neo-classical microeconomics, and evolutionary economics (Barney, 2001), but they all share a common emphasis on understanding why some firms can consistently outperform others. That is, the RBV theory means to explore how a firm's resources drive its performance in a dynamic competitive environment (Collis and Montgomery, 1995, Song et al., 2005, Julienti Abu Baker and Ahmad, 2010, Rifat, 2017). Based on the RBV perspective, resources are the key enablers for a firm to achieve competitive advantage and improve its effectiveness and efficiency (Barney, 1991, Richard L. Priem and John E. Butler, 2001). The RBV perspective highlights the importance of resources in achieving competitive advantage, and the elements of a business model should be designed to effectively utilize these resources to constantly create and capture value for companies. From the RBV perspective, organisational culture is the source of sustaining competitive advantage when it is valuable, rare and imperfectly imitable (Barney, 1986).

2.1.3. The Dynamic Capabilities (DC)

Building on RBV, the Dynamic Capabilities (DC) perspective emphasizes that a firm's sustainable competitive advantage is not solely determined by its existing resources, but also by its ability to continuously create, integrate, and renew its resources and capabilities over time. Dynamic capabilities are part of a system that includes resources and strategy. Together they determine the degree of competitive advantage an individual enterprise can gain over its rivals (Teece, 2018). Going further than one of its antecedent theories, such as system theories, which emphasize internal stability over time and homogeneity across similar systems, dynamic capabilities include an explicit role for management/leadership that allows systemic change to start from within, which is the source of heterogeneity across firms (Teece, 2018). Dynamic capabilities are usually hierarchized and divided into different levels or layers of operation or functionality. Those layers mostly include ordinary capabilities, which consist of the processes that deploy people, facilities, and equipment to carry out the current business of the firm (Teece, 2018), and microfoundations, which allow the firm to integrate, reconfigure, add, or subtract resources, including ordinary capabilities (Eisenhardt & Martin, 2000). The higher-level dynamic capabilities are activities and assessments that channel other capabilities and resources so as to maintain external fitness. They encompass organizational processes as well as unique managerial decisions (Augier & Teece, 2009; Teece, 2012, 2016).

The two other main components of the dynamic capabilities framework are resources and strategies. Resources include employees, equipment, buildings, and intangible assets (Teece, 2018). Whereas capabilities are primarily about what to produce and how and where to make, market, and distribute it, strategy helps to determine the timing of market entry and how to keep competitors at bay. The goal of strategy is to outmaneuver competitors by taking advantage of their mistakes and leveraging in-house strengths. It is the purview of strategy theories such as Five Forces (Porter, 1980). Capabilities, resources, and strategy constitute a system of interdependent elements that collectively determine the competitiveness of a firm (Teece, 2018).

2.1.4. Summary and Rationale for the Thesis

To sum up, Michael Porter’s Five Forces Model argues that a company’s competitive advantage depends on its positioning in the market. RBV is concerned about how a company employs and deploys its resources to create its unique configuration of resources to differentiate itself from others. Dynamic capabilities is the capabilities to use the company’s resources employed and deployed by RBV. So, RBV and DC will

be the theoretical framework that will guide the discussion on business model and eventually lead to the suggestion of a more comprehensive and adaptable business model. However, some scholars have criticized the RBV and DC perspectives for oversimplifying the role of resources in creating competitive advantage and ignoring the dynamic and contextual aspects of innovation and entrepreneurship (Foss and Saebi, 2016, Hutchinson et al., 2021). Viewed from this angle, RBV and DC are not applicable for managers to enhance their competitive advantage unless they are implemented by an appropriate business model, because a business model is the way to enhance competitive advantage.

Based on RBV and DC, this thesis' argument is that a business model is a configuration of capabilities, resources and activities (working definition), and different configurations can generate different outcomes. By exploring the different configurations of business elements and how they actually lead to different innovation performance,, we are able to answer the question, what business model (configuration) can help a manager to facilitate the performance of innovation and even lead to its sustainable competitive advantage? To answer this question, we first need to discuss the concept of innovation as it relates to economic returns and innovation as a value system.

2.2. Innovation and economic returns

An important factor in building or enhancing a firm's competitive advantage is the adoption of innovation, which can help create and deliver value to meet or even exceed the customer's expectations (Narver et al., 2004). However, when an innovation is developed and/or implemented by a firm to differentiate itself from its competitors, it is imperative to find a way to turn it into economic returns. Yet, it is not clear how to exactly achieve this process. In this section, we will review and analyse the different attempts in using innovation to maintain a competitive advantage.

2.2.1. Innovation

Innovation has been extensively discussed over the last decade in its relationship with business performance (Hult et al., 2004, Neely, 1998, Kirca, 2012, Rosenbusch et al., 2011). Some researchers find that innovation enables a firm to perform better than its rivals in the marketplace (Barney, 1991, Day, 1994). One of the issues they raise is how to embody innovation into a value proposition for firms to gain competitive advantage (Damanpour and Gopalakrishnan, 2001, Afuah, 2004, Porter, 1985, Neely, 1998). In this regard, they focus on how commercialising innovation into products can enhance superior customer value (Narver et al., 2004, Kwaku Atuahene-Gima, 2005, Chesbrough, 2007, Bodlaj, 2010, Lakshman et al., 2017).

So it goes without saying that innovation is important for business performance, but focusing only on product innovation may not secure companies' success in the marketplace (Deshpandé and Farley, 2004, Liu and Buck, 2007, Christensen, 1997, Markides and Geroski, 2004, Chesbrough, 2004, Narver et al., 2004, Teece, 2006, Baden-Fuller and Haefliger, 2013). This means that it is also important for companies to balance their focus on technological innovation with a consideration on creating value for the customer and delivering the product to them (Teece, 2010a, Zott and Amit, 2010, Zott and Amit, 2012, Baden-Fuller and Morgan, 2010, Johnson et al., 2008, Hu and Chen, 2016, Snihur, 2018, Sun and Liu, 2020). One way to do this is to rely on the company's business model, which is the way the company can configure its resources and activities to commercialize the innovation and benefit the company (Afuah and Tucci, 2001, Achtenhagen et al., 2013, Rosenbloom, 2002, Teece, 2006).

Since innovation seems to be a broad term that can be difficult to commercialise and turn into economic returns, Damanpour and Aravind (2012) suggest a categorisation that could narrow and refine the different and specific uses of innovation. They talk about a technology-based innovation that can facilitate the change of product and

production systems, an adoption of novel service to enhance the organisation's output in product and service to the customer, an adoption of a new approach to motivate the organisation's members while devising strategy and structure and modifying the managers' perspectives and administrative system, and finally radical and incremental innovations that can contribute significantly to change the technology/organisation/industry and make improvements by adding minor changes to the existing products or services. The preceding typology shows that innovation is drawn as novel ways to combine multiple existing resources and skills aiming at importing newness into the marketplace purposefully (Paladino, 2007, Gunday et al., 2011). As such, innovation can then be viewed as a two-pronged process: invention and commercialisation. Invention implies the use of new knowledge to create or discover new things that can be translated into a product or service. However, this first prong of the diptych may not necessarily lead to economic returns until these novel ideas can be commercialised (Afuah, 2004). So, innovation sets the cursor in the direction of commercialisation by indicating the new product or process, the new approach to deliver superior customer value and the source of competitive advantage of a firm.

Specifically, the diptych invention-innovation refers to how a firm acquires its intended performance by commercialising the new ideas. Meanwhile, the steps and chronology of developing, adopting and embodying innovation proceeds continually since the market constantly changes. Thus, the key point about how innovation contributes to business performance lies in successfully launching new products or processes into the market and making a profit (Freeman, 1982).

In summary, we define with OECD (2005) that innovation is a new or significantly improved product (good or service), process, new marketing method, or new organisational method. That is to say, apart from the product and process innovation, innovation also indicates a means to transform an organisation to influence the market by launching a new product/service, new production process or new administrative system (Hult et al., 2004). We also argue that innovation is a constant process in adopting new ideas and generating new applications for firms to perform better by adapting to the changing environment (Paladino, 2007, Gunday et al., 2011, Hult et al., 2004). Innovation success refers to launching the new product or process into the target market with a positive response and value return associated with an adequate combination of resources and skills (Freeman, 1982, Afuah, 2004, Paladino, 2007).

2.2.2. Innovation performance

Innovation performance can be viewed as the generated outcomes driven by recombining assets and resources corresponding to the implementation of new ideas (Rajapathirana and Hui, 2018), and by adopting new and value-adding ideas when a firm changes the products, processes, and market establishment (Weerawardena, 2015)]. OECD (2005) addressed the concept of innovation performance by enclosing multidimensional measures in terms of technological innovation (product and production process), non-technological innovation (marketing and organisational), and the percentages of sales generated by new products. This means that the success of innovation can be measured by selling products or services and managing more people to adapt to the new organisational structure and business processes. This can be done by providing internal controls and external accountability.

So, innovation lies not exclusively on a particular kind of application. The diversified measurement theme reveals multiple focuses that the adopted newness attempts to achieve. For example, innovation is viewed as the facilitator of a firm's financial performance, and the approach for this sort of performance lies in multiple aspects such as sale of new products (Atuahene-Gima and Ko, 2001, Bodlaj, 2010), the ratio of new products sales in the total sales (Wu et al., 2016, Li et al., 2017), the new product's market share (Atuahene-Gima and Ko, 2001, Bodlaj, 2010), the rates of the investment asset return (Atuahene-Gima and Ko, 2001), and the rates of investment return and profit objectives (Atuahene-Gima and Ko, 2001).

Based on Schumpeter (1934), a firm reaches its success not merely by associating itself with market power or industry structure, but also by introducing and applying new ideas into product design and/or process (Hult et al., 2004), and by launching newness into the market (Gunday et al., 2011). Therefore, apart from the previously addressed types of innovation performance, time to enter the market is also vital in validating how innovation contributes to a firm's competitive advantages. This contribution can be measured by the speed of introducing new products or services (Rajapathirana and Hui, 2018, Han and Chen, 2018) and the frequency of new product introductions (Kwaku. Atuahene-Gima, 2005, Zhang et al., 2018).

The strategic purpose can be reflected on a firms' innovation performance when the following is observed: technical performance relative to objectives is attained (Salomo 2007), product quality relative to objectives is attained (Salomo 2007), manufacturability relative to objectives is attained (Salomo 2007), early adoption of

new technology (Gök and Peker, 2016), the novelty of new product (Wu et al., 2016), the number of novelty applications (Wu et al., 2016), and the number of forwarding patent citations and subsidiary have been received (Piperopoulos et al., 2018). Innovation improving performance, on the other hand, relates to how a firm improves its process efficiency in product design, manufacture, and organisational operation. For instance, a company may focus on innovation efficacy (the degree of success of an innovation) and innovation efficiency (the effort made to achieve that degree of success) (Alegre and Chiva, 2008). A company may also meet planned budget (Salomo 2007) and timetable (Salomo 2007), while renewing the administrative system and the mindset in line with a firm's environment (Gunday 2011). Finally, a company could speed the product/service development (Gok 2017,Wu 2016) and lower operating costs for new products (Han and Chen, 2018).

To sum up, innovation performance reflects the results generated by adopting multiple new ideas (OECD, 2005, Damanpour and Aravind, 2012), the recombination of the resources and assets (Rajapathirana and Hui, 2018) associated with the combination of purposeful activities (Weerawardena, 2015). Business model is presented as the architecture to accommodate innovation and facilitate innovation performance (Teece, 2010a). Even though various types of innovation performance indicating different approaches of how firms can be competitive in the market has been discussed in the literature, there is not enough explanation of how innovation performance can be generated.

2.2.3. Market orientation

When innovation enables a firm to fulfil the customers' needs by offering a new product or solution to the market, marketing orientation is the factor that helps a firm to learn the customer's needs (Slater and Narver, 1990, Narver et al., 2004). Narver et al. (2004) also explained that marketing orientation was based on distinguishing the customers' needs. Interestingly, the arguments from the marketing literature imply that marketing orientation might lead to a resistance to innovation because a firm might be listening too carefully to the customer and might be focusing on their needs too deeply (Atuahene-Gima et al., 2005, Narver et al., 2004). In response to the possibility of a resistance to innovation, scholars have addressed the notion of responsive and proactive marketing orientation. Responsive marketing orientation (RMO) emphasises the satisfaction of the customers' expressed needs, where customers are aware of their current status (thirsty) and comprehend what they want (water). Proactive marketing

orientation (PMO), on the other hand, looks at the latent need of the customers. These potential needs might not be comprehended at the current moment but shall be satisfied in an innovative way shortly. Therefore, market orientation facilitates the emergence of innovation embedded in a new product or solution to create or add value to the customer (Kwaku. Atuahene-Gima, 2005, Slater et al., 2014).

The central concept of marketing orientation is to deliver value that the customer exceptionally recognises (Slater and Narver, 1990, Kohli and Jaworski, 1990). Porter (1985) argued that the importance of the value perception by the customer is the foundation for firms to develop a competitive advantage. In a more nuanced perspective, Blocker et al. (2011) claimed that different marketing orientations (PMO/RMO) have different influences to drive the customer value perception and further affect customer satisfaction. In the same school of thought, Atuahene-Gima et al. (2005) explored how marketing orientation yields different influences on new product performance, while Lakshman et al. (2017) concluded that PMO significantly affects a company's openness to adopt and implement new ideas in new product development as attributions to business performance. So, the combination of innovativeness and new product development (NPD) leads to the success of new products under the PMO (Zhang and Duan, 2010). These arguments provide examinations into how distinguished marketing orientation boosts innovation and influences its performance. Specifically, by comparing the innovation type, the implication of PMO and RMO is consistent with the purpose of radical innovation and incremental innovation.

Proactive and responsive marketing orientations have also been examined in relation to cost-leadership and product differentiation among the strategic perspectives (Kharabsheh, 2015). Specifically, the review of the literature indicates that radical and incremental innovation can be associated with PMO and RMO to fulfil varied customer's need and create competitive advantages. In short, radical and incremental innovation reflect a firm's strategy aiming at satisfying its customer to create the competitive advantage. However, the method to embody the chosen innovation during this process is not specified.

Applying innovation is a way to attract customers or maintain customer loyalty as a value-adding approach (Narver et al., 2004). From the marketing perspective, innovation should align with the marketing orientation to fulfil or even exceed customer's expectations (Narver et al., 2004). This can be done by implementing

innovation in the production of new products to facilitate business performance (Neely, 1998). Studies have discussed the relationship between innovation and marketing orientation. Atuahene-Gima (1996) addressed the significant influence in the marketing orientation to product innovation. Narver et al. (2004) claimed that innovation orientation facilitates business performance through learning and tracking customers' needs, developing new products or services, and enhancing internal processes to utilise innovation in new product and service development. This perspective highlights the implementation of innovation by either focusing on predicting the latent or future need of the customer or by satisfying the existing requirement using different approaches to add value (Slater and Narver, 1990, Narver et al., 2004). Thus, regarding how marketing orientation restricts the firm's innovation capacity and restricts new product development, PMO and RMO perspective depicts the specific purpose of each of them and how the innovative product development can be facilitated by different approaches.

Briefly speaking, even though innovation performance is the outcome of novel ideas implemented in product design or process improvement, the incorporated marketing orientation is still imperative in determining how the chosen innovation type can satisfy the customer and reach its intended success.

2.3. Innovation and value system

Innovation is one of the main drivers for business performance (Bodlaj, 2010, Bodlaj et al., 2012) and the approach for profitability (Narver et al., 2004, Kwaku Atuahene-Gima, 2005). OECD (2005) defined innovation as the implementation of a novel or significantly improved subject in conducting business, internal organisation or external relationship associated with the types of product/service, process, marketing method and organisational method. In this section, we will review the concept of innovation as it relates to the notion of value system.

2.3.1. Value creation

In the earlier descriptions, the term "value" was defined as the economic notion reflecting on what a customer will pay for a product or service (Chesbrough and Rosenbloom, 2002). The discussion on the transaction of value in new business environment had drawn the key question: What value provided by a firm would cause the customer to pay? (Chesbrough, 2007, Zott and Amit, 2012, Teece, 2010a, Foss and Saebi, 2016, Kwaku. Atuahene-Gima, 2005, Narver et al., 2004). Chesbrough and Rosenbloom (2002) described business model as a powerful tool that contributes to value creation. They argued that technology innovation underpins the development of a new product that carries the proposed value to benefit users. For example, these innovative technologies aim to generate better quality products (Xerox), increase effectiveness (3Com), reduce cost and speed up the process (Documentum). Besides, these innovative products need to work with a specific business approach to gain revenue. That is to say, the innovation developers need to explore what options work along with their offered products that customers will pay for and when these payments can be collected (Shafer et al., 2005, Chesbrough and Rosenbloom, 2002). In short, the products offered by firms are expected to carry the value proposition (Chesbrough and Rosenbloom, 2002, Johnson et al., 2008) and innovation (Teece, 2010a, Magretta, 2002), and the delivered value need to be monetised (Shafer et al., 2005, Chesbrough and Rosenbloom, 2002). However, a value proposition is not merely the offering to meet customers' needs (Richardson, 2008); greater value can be embedded in product, enabling a firm to gain its competitive advantage and strategic position in the market (Hamel, 2001).

It is noticeable that value creation can be grounded in product design and manufacturer process to embody the value proposition, and that also means the adopted innovation can be realised for fulfilling the generic strategy choices (product differentiation and cost-leadership) for firms to gain competitive advantage (Teece, 2010a, Casadesus-

Masanell and Ricart, 2010). Moreover, Johnson et al. (2008) emphasised the importance of profit formula to explain how the created value can also benefit the firm itself. Specifically, the profit formula is the plan and endorsement of value capture, demonstrating the viability of collecting economic returns in relation to the value they create. In summary, value creation refers to the process to embody the strategic idea and innovation into products, which requires a business model as a complimentary to offer the solution that customers are willing to pay for.

2.3.2. Value delivery

The emergence of the internet provided a new and transparent business environment which broke the existing walls of business transactions and further opened access to new paths to deliver products and services (Timmers, 1998, Amit and Zott, 2001, Afuah and Tucci, 2001). However, the importance of value delivery is not merely in regards to handing over the product to the customer; instead, the innovative way of product distribution can lead to variations of the product itself or even the entire business model (Teece, 2010a, Chesbrough and Rosenbloom, 2002).

Value delivery describes in what way the value can be delivered to and appreciated by the customer (Chesbrough and Rosenbloom, 2002, Johnson et al., 2008, Shafer et al., 2005, Teece, 2010a, Richardson, 2008). OSTERWALDER (2002) addressed the channel strategy as “direct” or “in-direct” sales, to reflect how firms “go to the market” and “reach the customer”. For instance, British Petroleum worked with supermarket chains to launch its novel distributive spot and add the product line by selling cheaper gasoline (Shafer et al., 2005). Dell (laptop manufacturer) shortened the communication procedure and time with its suppliers and manufacturers, which enabled Dell to redefine its value chain and build its direct selling network (Teece, 2010a). Radiohead (the band) released its brand-new music track “In Rainbows” through the band’s official website for one month to boost the sales of traditional music record channels and achieved five to six times sales compared to Radiohead’s previous CD (Chesbrough, 2010). Put simply, a firm needs to clarify its position in the value network to identify the linkage between suppliers, customers and itself (Chesbrough and Rosenbloom, 2002, Richardson, 2008) and extend the company’s own resources to deliver value proposition innovatively (Shafer et al., 2005).

So, a successful value delivery requires good understanding by firms to link stakeholders in value network. Meanwhile, key resources are also essential in value delivery which are deployed through the capabilities to form the unique configuration

of activities based on a firm's strategy (Richardson, 2008, OSTERWALDER, 2002, Johnson et al., 2008). Therefore, value delivery in the business model framework refers to the process of combining the capabilities, resources, and activities to deliver the product to the customer.

2.3.3. Value capture

The monetisation of what has been offered to the market is one of the primary concerns of an entrepreneur (Zott and Amit, 2007, Doganova and Eyquem-Renault, 2009), technology innovator (Chesbrough and Rosenbloom, 2002, Teece, 2010a), and business manager (Afuah, 2004, Zott and Amit, 2012). However, superior economic return has not been guaranteed in successful value creation and delivery. Instead, the model that produces revenue and generates profit must work with product creation and distribution.

Teece (2010a) claimed that a significant value capture is derived from the successfully generated and delivered products/services, in which a compelling value proposition is accommodated. Which means, a business model can be innovated in new product making and through finding a better way to distribute the product (Zott et al., 2011, Magretta, 2002, Johnson et al., 2008). In addition, long-term financial success can be seen as the examination of the performance of a product, service, and customer relationship (OSTERWALDER, 2002).

In terms of value capture, three specific elements explain how a firm can gain benefit. Revenue source refers to how and when the customer can pay for the product (Chesbrough and Rosenbloom, 2002, Baden-Fuller and Haefliger, 2013). Profit formula means to guide how a company can create value for itself through its offering (Johnson et al., 2008). The economic model indicates the profit equation including revenues, costs, and expense, which reflects the operating cash flow statement as well as the notion of making money (Richardson, 2008).

In the case of Xerox, it altered its revenue source from product sales to the long-term leasing model (Chesbrough and Rosenbloom, 2002). Tata (an automobile company), on the other hand, reduced the production cost by adjusting the product design and production procedure to create a significant gap between the revenue model, cost structure, margin model and resource velocity to generate more profit than its rivals. (Johnson et al., 2008). As for the new telematics technology developer "On-star", the decision of changing the product format to fit all automobile manufacturer applications

brought them more financial success than only providing the technology in their firm (GM) device (Shafer et al., 2005).

The above cases present that the successful value creation and delivery would not guarantee the expected economic return only when the revenue and profit factors have been put into a firm's consideration. Especially, although the creation and delivery of innovative products are meant to meet or exceed the customer's needs for firms to gain a competitive advantage, outperforming rivals in the market does not necessarily indicate that profit can be derived from the innovative product.

2.4. Working definition of business model (BM)

Definitions play a crucial role in academic research and are central to understanding concepts and theories presented in scholarly works. In the field of business model research, there are various definitions and dimensions of the term. The definitions range from describing business models as architectures, to designed instruments that accommodate particular themes to gain profit, to a way that an enterprise creates and delivers value to customers, and then converts payments received into profit. Each of these definitions has its own merits and limitations, and it is essential for scholars to carefully consider the definition that best fits their research question and context.

The dimensions of business model definitions vary as well. Some scholars have focused on the level of innovation and the integration of functions (Teece, 2018a, Leih et al., 2015b, Baden-Fuller and Haefliger, 2013), while others have focused on the content, structure, and governance of transactions designed to create value through the exploitation of business opportunities (Zott and Amit, 2013, Zott and Amit, 2010). Still, others have emphasized the strategic choices made by firms to compete with rivals in the marketplace or the interrelated set of decision variables in the areas of venture strategy, architecture, and economics that are addressed to create sustainable competitive advantage in defined markets (Todeschini et al., 2017, Sousa-Zomer and Cauchick Miguel, 2018, Geissdoerfer et al., 2018).

One argument in favor of the definition put forward by Teece (2010a) is that it aligns with the current business landscape, which emphasizes the importance of creating and delivering value to customers. This definition highlights the process of value creation and delivery, which is essential for businesses to survive and thrive in a competitive marketplace. Additionally, Teece's definition acknowledges the importance of converting payments received into profit, which is a critical component of any successful business model.

However, it is also essential to consider the limitations of this definition. For example, it may not fully reflect the strategic choices made by firms to compete with rivals in the marketplace, as described by Magretta (2002). Furthermore, Teece's definition may not be comprehensive enough to account for the interrelated set of decision variables that Morris et al. (2005) identified as key components of a business model.

Overall, it is crucial for scholars to consider the definitions and dimensions of business models that best fit their research questions and contexts. No single definition can capture all the complexities of business models, and different definitions may be more

appropriate for different research questions and contexts. Therefore, when strategy refers to a firm's choice of making a contingent plan of action to face competition, a business model reflects the strategic choice and innovation as the particular way or logic to operate in value system (Casadesus-Masanell and Ricart, 2010, Teece, 2010a).

2.4.1. Business model review

By following the research aim and the objective, this study reflects the literature related to multiple business models. Stated differently, a key question to this existing academic discussion is what motivates a firm to adopt a particular business model to capture value. Scholars have defined a business model as a configuration of factors that contribute to sustainable competitive advantage (Markides and Sosa, 2013, Kim and Min, 2015, Waghmare and Golhar, 2017, Schneider, 2019, Sousa-Zomer and Cauchick Miguel, 2018). Specifically, a business model is the way in which a company combines its resources, capabilities, and activities to achieve its strategic objectives in the face of market conditions.

In the early stage, the focus of business model study was on observing the distinctive ways to create value in a certain business environment. Scholars explored a framework that could link stakeholders and resources to create business opportunities (Zott and Amit, 2007). In recent years, academics and industry practitioners drew attention to how innovation can be accommodated or facilitated by a business model (Zott and Amit, 2010, Richardson, 2008, Johnson et al., 2008).

In 1998, Timmers defined a business model as a framework that outlines how a company generates revenue by exploring the value created and delivered in their product, information, and services. To further clarify this concept, Timmers identified eleven types of business models, including e-shop, e-procurement, and e-auction, each with a specific approach to generating profit. This definition and the various business model types illustrate the importance of a company's chosen focus in competing in the market. Essentially, a company's chosen business model indicates how they plan to differentiate themselves from their competitors and generate revenue in the process. In the same vein, Amit and Zott (2001) go deeper and define a business model as the method by which a company organizes and manages its transactions to generate value. They suggest four potential sources of profitability and introduce four corresponding business models: efficiency, novelty, lock-in, and complimentary. Primally, a business model serves as a roadmap for companies to navigate their current position within a business network, and the specific type of business model chosen can greatly influence

how a company overcomes the existing barriers to profitability. That is, a business model plays a crucial role in enhancing a company's competitive advantage through innovation. This is achieved by focusing on two strategic objectives: facilitating the performance of innovative products and keeping the company's business approach dynamic to adapt to environmental changes. In other words, a business model allows companies to remain competitive by identifying how value can be continuously created to the market (Amit and Zott, 2001).

Relatively, Teece (2010a) defined business model as the way that an enterprise creates and delivers value to customers, and then converts payments received into profit (p173). Multiple cases were enumerated to elucidate how innovation contributes to the value creation and delivery, which aligns with the consideration of the economic return. Alongside considering value system as the business model framework, the key factor of creating competitive advantage for firms also lies in finding the coherence among capabilities, strategy and the business model (Teece, 2018a). While technology advancement led to external business environment changes, distinctive capabilities are imperative for firms to detect market opportunities and take actions to stay competitive. Chesbrough and Rosenbloom (2002) shared this viewpoint and argued that a business model can mediate technology development into economic outputs, but innovation is co-existing and interactive in product and value delivery systems.

However, the composition of a business model remains vague, particularly for managers who need to constantly reconfigure their business model content elements to remain dynamic and respond to environmental changes (Kim and Min, 2015, Philipson, 2016, Velu, 2016, Foss and Saebi, 2016). Meanwhile, high technology firms that focus on new product development face the challenge of acquiring new business model components and/or reallocating current ones to enhance their competitive advantage and benefit the company (Zott et al., 2011, Achtenhagen et al., 2013, Foss and Saebi, 2016, Demil and Lecocq, 2010).

The existing studies of business model have focused on exploring its purpose, framework, and composition. These studies appear to draw concerns around "what" a business model is and "how" companies benefit from a business model. Yet, when considering how business model can facilitate innovation performance through value creation, value delivery and value capture, the current discussion has focused on how value is created and delivered. Instead, there is a noticeable absence of research dealing with what business model (or models) contributes to value capture (Amit and Zott, 2001, Amit and Zott, 2002, Atuahene-Gima et al., 2005, DP Lepak, 2007, Olsson and

Larsson, 2009, Zhang et al., 2016, Teece and Linden, 2017). The recent studies on business model design and innovation indicate that different business models generate different outcomes (Chesbrough, 2010, Zott and Amit, 2010, Zott and Amit, 2012, Bengtsson, 2018). Still, the question of how companies can perform differently in their markets remains unclear. Therefore, as stated in the beginning, this study aims to shed light on the undisclosed sources of sustainable competitive advantage by exploring how managers can frame, constitute and innovate their business models to help companies make profits constantly.

The composition of business model elements determines how a company differentiates itself and competes with other rivals in the market. This notion fits into the RBV and DC perspective, as we discussed in the beginning of this literature review, suggesting that the valuable, rare, imperfectly imitated and unsubstituted (VRIN) resources enable the company to perform its intended activities, and create the competitive advantage (Barney, 1991, Teece, 1997, Afuah, 2004, Teece, 2010a). However, the addressed business model construct is inadequate to further analyse how the business model configuration affects innovation performance since very few studies have elucidated upon the composition of different business models and their purposes and, as we mentioned earlier, some scholars have criticized the RBV and DC perspectives for oversimplifying the role of resources in creating competitive advantage and ignoring the dynamic and contextual aspects of innovation and entrepreneurship (Foss and Saebi, 2016, Hutchinson et al., 2021). Nevertheless, there have been some attempts to categorize or compare different types of business models based on their characteristics or functions (Chesbrough and Rosenbloom, 2002, Demil and Lecocq, 2010). So, the relationship between business model configuration and innovation performance may also depend on the stage of the innovation process, the type of innovation (incremental vs. radical), or the level of industry disruption (Markides, 2013, Chesbrough, 2020).

To identify the business model that facilitates innovation performance, various business model frameworks are available. These frameworks help companies identify which aspects of their current business model they can innovate to improve performance (Johnson et al., 2008, Richardson, 2008, Clauss, 2016). Alternatively, the frameworks can help companies assess whether they need to develop an entirely new business model (Mitchell and Coles, 2003, Casadesus-Masanell and Zhu, 2013, Teece, 2010a). However, the current general understanding of the business model construct is not enough to fully explain the composition and purposes of different business models, and the identification of the content elements and how they interact with each other are barely discussed (Geissdoerfer et al., 2018, Wirtz et al., 2016). So, filling the above

gaps can help managers design and implement their business model to better understand how the configuration of a business model affects innovation performance, and make them stay competitive while constantly facing challenge in their dynamic market. Consequently, this study aims to identify how differences between business models contribute to value capture. Few studies have explored this topic in depth, and this study seeks to address this gap in knowledge.

2.4.2. Business model design

Business model design is a reflection of strategic choice, where strategy involves creating a unique value position through relevant resources and capabilities, responding to external market changes and opportunities. The business model is the blueprint or know-how of linking strategic and daily activities, configuring and utilizing capabilities, deploying and employing relevant resources, and performing intended activities to satisfy customers and earn profit (Casadesus-Masanell and Ricart, 2010, Afuah, 2004, Teece and Linden, 2017, Zott and Amit, 2010). Business model design is critical to determine the most effective ways to satisfy customers, respond to external market challenges, and transfer value in a business model (Zott and Amit, 2012, Baden-Fuller and Morgan, 2010). The business model identifies how an enterprise delivers value to customers, entices them to pay for that value, and converts those payments into profit. Ultimately, the business model enables a firm to create a competitive advantage by successfully implementing its strategic choices.

According to Zott and Amit (2007), a business model depicts the content, structure, and governance of business transactions designed to create value through the exploitation of business opportunities, and further derive the design elements and themes to yield effective behaviour. Under the notion of value creation, delivery and capture, scholars have attempted to explore the framework accommodating activities to benefit the stakeholder in value networks (Chesbrough and Rosenbloom, 2002, Richardson, 2008, Teece, 2010a, Shafer et al., 2005). The extensive literature follows the value system concept considering a business model as an activity system that operates to manage the interaction of the business elements to construct the framework (Casadesus-Masanell and Ricart, 2010, Zott and Amit, 2010). Osterwalder (2002) elaborated the elements of a business model as product innovation, customer relationship, infrastructure, and financial aspects, and addressed the configuration of these activities as the value worthy to pay by customers. Afuah (2004) argued that business model regards which activities a firm performs and how and when it performs to earn profit. Basically, a business model contains a bunch of specific activities which

can create the firm's competitiveness if they are unreplaceable by the market rivals for some time.

The implementation of business activities is to consider how a business system works in sequence to make or lose money by providing value to the customer (Afuah 2004). Hence, the way a firm arranges and performs its activities impacts its differentiation position in the marketplace (Magretta 2001, Afuah 2004). A great variety of business activities related to innovation has been addressed in the literature such as product, process, organisational, marketing, technological innovation activities (Ceylan 2012, Uzun, 2001) or inbound and outbound logistics (Porter (1985), among others. All these activities were an attempt to present the elements to fulfil the strategy choices and gain the competitive advantage. So, a business model's role is to configure and utilise those activities to reflect the strategic choices for firms to construct their value system and compete in the marketplace.

In order to perform a firm's intended activities, the relevant resources are essential for fulfilling the overall objectives (Zott and Amit, 2010, Afuah and Tucci, 2001, Afuah, 2004). Based on the RBV perspective, resources are the key enablers for a firm to achieve competitive advantage and improve its effectiveness and efficiency (Barney, 1991, Richard L. Priem and John E. Butler, 2001). Resources can be physical, human, or organizational capital, which form the basis for a firm to create value and achieve a sustainable competitive advantage. In the context of a business model, resources are the tangible, intangible, and human assets that underpin the execution of activities (Afuah, 2004). A well-designed business model should effectively utilize these resources to create and deliver value to customers, while also capturing a portion of that value as profit. Therefore, an effective business model should take into account the firm's resources and capabilities, and leverage them to create a unique value proposition that differentiates it from competitors. This requires an understanding of the firm's internal strengths and weaknesses, as well as external market opportunities and threats, to develop a business model that aligns with the firm's strategic objectives.

In summary, the RBV perspective highlights the importance of resources in achieving competitive advantage, and the elements of a business model should be designed to effectively utilize these resources to create and capture value. By viewing a business model as a value framework, the configuration and utilisation of resources corresponding to the selected activities signifies the way a firm has its value created

and delivered (Richardson, 2008, Shafer et al., 2005, Zott and Amit, 2007, Johnson et al., 2008).

2.4.3. Working definition of business model

Based on the review of the literature, multiple business models exist, and they carry different purposes and generate various outcomes (Teece, 2010a, Chesbrough and Rosenbloom, 2002, Zott and Amit, 2012, Baden-Fuller and Haefliger, 2013, Timmers, 1998, Zott and Amit, 2007). These purposes indicate a firm's strategic aims to differentiate itself from rivals (Barney, 2001a, Casadesus-Masanell and Ricart, 2010, Teece, 2010a). Stated differently, business model plays a role as the approach to embody the strategic choice by reflecting a firm's unique way to configure its business components to create, deliver and capture value (Zott and Amit, 2012, Teece, 2010a, Richardson, 2008). Meanwhile, the configuration of the selected components determines how a firm design its business model to generate the intended outcome (Teece, 2010a, Chesbrough and Rosenbloom, 2002, Zott and Amit, 2012, Baden-Fuller and Haefliger, 2013, DeSarbo et al., 2005).

Even though the given perspectives shed light on the essence, types, and purposes of business model, how it can be designed and employed by companies to create competitive advantages remains vague. Limited literature explained in what way the business model heterogeneity can be elucidated and how the derived discrepancies generate the various outcomes. Therefore, exploring business model components is necessary to examine the construct of business models and learn the discrepancies that emerged among them. To be specific, business model heterogeneity reflects on what activities to offer (Afuah, 2004, Afuah and Tucci, 2001, Zott and Amit, 2010, Morris et al., 2005),what resources and capabilities are required to perform the activities (Afuah, 2004, Morris et al., 2005, Zott and Amit, 2007, Ranjith, 2016), and how they work with each other to drive the operation of a value system (Afuah, 2004, Teece, 2010a, Zott and Amit, 2012, Magretta, 2002). Thus, to fulfill the research gap addressed previously, we define a *business model as a strategic choice a company makes to configure and use pertinent capabilities, resources, and activities to compete in the marketplace.*

2.5. Organisational culture and structure

Business model is the approach to deploy and employ the assets by which the value could be created, delivered, and captured in a unique way (Teece, 2010, Teece, 2018, Foss and Saebi, 2016, Markides, 2013). Organisational structure contributes to a firm's competitive advantage by (governing) the implementation of the business model (Chen and Fung, 2013). Regarding the source of competitive advantage, organisational culture determines the company's decision of adapting to environmental challenges (Olson et al., 2005, Klein, 2008, Klein, 2011). In this section, we will look at the elements of organisational culture and structure, the interaction between organisational culture and structure, and how they relate to business model.

2.5.1. Organisational culture

In the literature, organisational culture is considered as the source of competitive advantage (Fiol, 1991, Klein, 2008, Madu, 2012, Gómez-Miranda et al., 2015). A firm's organisational culture is its unique assets, which contribute to accomplish the different strategic purposes (Olson et al., 2005, Klein, 2008, Erosa, 2012). Managers need to strategically create the organisational culture, meaning to enable the firms to favourably embed innovation into the organisational process (Feldman, 1988, Naranjo Valencia et al., 2010) to create value (Klein, 2011, Erosa, 2012, Muratovic, 2013) and adapt to environmental change (Olson et al., 2005, Klein, 2008, Klein, 2011).

Given the importance of organisational culture in the literature, scholars have multiple perspectives as to how it affects the organisation and its performance (Lim, 1995, Ogbonna and Harris, 2000, Hogan and Coote, 2014, Boyce et al., 2015, Kamasak, 2015, Naranjo-Valencia et al., 2016, Huang et al., 2015, Chen et al., 2018). Some researchers consider organisational culture as the shared values, beliefs, behaviour norms and assumptions manifested within the organisation to affect the employee's behaviour (Schein, 1985, Schein, 1984). Especially, organisational culture determines how the organisation's members view the world (Janicijevic, 2011), and that affect the way they learn to cope with internal and external problems (Schein, 1984).

From the RBV perspective, organisational culture is the source of sustaining competitive advantage when it is valuable, rare and imperfectly imitable (Barney, 1986). By possessing this unique asset, a firm can constantly transfer its resources into actions and then generate the expected outcomes (Fiol, 1991). In terms of managemental perspective, a firm's leader can apply the created organisational culture

to enhance the firm's competitiveness by maintaining organisational growth, good services, and the ability for problem-solving through moral and ethical behaviour (Madu, 2012). Moreover, organisational culture has been examined to enable managers to focus more on results and to enhance staff to be better involved in corporate governance to reach the better levels of competitiveness, effectiveness and efficiency (Gómez-Miranda et al., 2015).

Researchers have found that strategy is an essential factor in how firms enhance or sustain their competitive advantage. In other words, a firm can develop or adopt different strategy leading to the possession of unique resources and the generation of strategic actions and results (Fiol, 1991, Peteraf, 1993). The implementation of the chosen strategy can be facilitated by the organisational culture (Klein, 2011, Boyce et al., 2015), and various cultural orientations guide the execution of different innovation activities (Erosa, 2012). Especially, when firms attempt to apply innovation in the organisation, managers will need to adopt specific cultural type(s) corresponding to the strategical objectives. Regarding the types of organisational culture, Cameron and Quinn (1999) developed the competitive values framework (CVF) and identified four types: adhocracy, clan, market and hierarchy. Naranjo Valencia et al. (2010) adopted this CVF to examine the relationship between organisational culture and product innovation and distinguished the impact of these culture types on innovation. Specifically, their studies explored the fact that an adhocratic culture could enhance product/service development, and product innovation is inhibited by a hierarchical culture. Similarly, culture values have also been shown to be relevant to innovation. Organisational culture values such as success, openness and flexibility, internal communication, competence and professionalism, inter-functional cooperation, responsibility of employees, appreciation of employees, and risk-taking play the role of precursor of innovation behaviour and help to shape the innovation process (Hogan and Coote, 2014).

Distinct from the organisational types and values, how organisational culture stimulates innovation behaviour can also be observed through the selected traits such as creativity (Amabile, 1988, de Jong and Den Hartog, 2007); freedom/autonomy (Basu and Green, 1997, Krause, 2004); empowerment (Amabile, 1988, Knol and Van Linge, 2009); risk taking and mistake tolerance (Woodman et al., 1993); and employee participation. The heterogeneity of organisational culture leads to various impacts on the organisation's innovation activities. Specifically, the configuration of distinct types, values, and traits of organisational culture plays a determinant role, as the antecedents of innovation, by creating shared values and by stimulating the employee's innovative behaviour to

embrace change. Simply put, the specific organisational culture can positively affect the strategically chosen innovations (Naranjo-Valencia et al., 2016, Naranjo-Valencia et al., 2017, Sultan and van de Bunt-Kokhuis, 2012) and further contribute to innovation performance (Padilha and Gomes, 2016, Shahzad et al., 2017, Kamasak, 2015). Comparatively, the firm's age and size do not necessarily impact upon innovation performance; instead, the innovation type that a firm endeavours to pursue matters in improving the growth rate and turnover as the indications of innovation performance (Laforet, 2016).

However, the impact of organisational culture is not always positive but could be a double-edged sword due to the existing cultural inertia that might hinder the introduction of timely and substantial change by managers. In other words, managers need to be cautious when considering which organisational culture, or the configuration of the organisational culture types, is required when a firm decides to apply a certain kind of innovation (Sultan and van de Bunt-Kokhuis, 2012, Feldman, 1988, Naranjo Valencia et al., 2010). Therefore, creating or adopting the selected organisational culture is exceptional for managers to stimulate innovation and subsequently improve the inherited innovation performance (Shahzad et al., 2017).

Chirico and Nordqvist (2010) demonstrated the path regarding how organisational culture positively affects the resources-recombination process towards the impact of transgenerational value creation. In their study, entrepreneur organisational culture plays an essential role in enabling a firm to counteract the existing inertia and embrace change. That facilitates resource-recombination and leads to a sustainable value creation. In addition, a strong organisational culture is essential for identifying value creation opportunities since dynamic capabilities help to recognise the external change (Leih et al., 2015a). For instance, a novelty-oriented culture value is addressed in favour of business model innovation by keeping the organisation interesting in finding new market opportunities or creating new types of transaction (e.g. new product development or new market address) (Hock et al., 2016). Simply put, the coherence between organisational culture, active leadership, and employee commitment supports strategic actions to sharpen, adapt, and renew the business model (Achtenhagen et al., 2013).

2.5.2. Organisational structure

Organisational structure plays a critical role in building a firm's competitive advantage. Recent studies indicate that managers who are engaging in recognising business opportunities need to be innovative to develop the business model for changing the

business's boundaries (Leih et al., 2015a, Zott and Amit, 2007, Teece, 2018a). Meanwhile, they are also expected to help the organisation's members adapt to business model transformation (Leih et al., 2015a). Under the RBV perspective, to implement the correlated organisational activities, organisational structure is one of the most prominent internal contexts constituting the working environment (Pettigrew, 1979) in which the flow of information, goods, and resources is generated (Chen and Fung, 2013). However, the crucial factor for accomplishing corporate goals lies in how organisational structure configures the context (e.g., tasks and activities) to support the innovation application (Skivington and Daft, 1991, Dekoulou and Trivellas, 2017). Through this, the strategy can be formulated and implemented combined with duties fulfilment and power exertion and control (Hunter, 2002, Spanos et al., 2001). Especially, organisational structure needs to be dynamic in response to the transformation of strategy and the corresponding business model for better adopting the innovation to face the changing environment (Damanpour and Gopalakrishnan, 1998, Leih et al., 2015a).

Business model is crucial for firm to embody its strategic ideas in responding to external environmental challenges (Teece, 2010a, Chesbrough, 2010, Casadesus-Masanell and Ricart, 2010, Richardson, 2008, Leih et al., 2015a). It needs to be dynamic for keeping itself innovative and improved (Teece, 2010a, Johnson et al., 2008). However, the gap between the firm's existing resources and the new business model execution will hinder the business model innovation (Chesbrough, 2010). The solution to shorten this gap lies in the leadership capabilities in designing the appropriate organisational structure to orchestrate and allocate the resources purposefully (Damanpour and Gopalakrishnan, 1998, Leih et al., 2015a), and facilitate the adoption of innovation within the organisation (Damanpour and Gopalakrishnan, 1998, Hunter, 2002, Leih et al., 2015a). In short, organisational structure is a dynamic environment constantly changing to correspond to the business model innovation (Chesbrough, 2010, Leih et al., 2015a).

The literature on the contingency theory addresses the relationship between the external environment, strategic choice, organisational design, and their systematic interactions (Lawrence and Lorsch, 1967). This relationship indicates that the way managers design the organisational structure correlates with organisational performance, which is associated with the type of the adopted innovation (Damanpour and Aravind, 2012) and the means to facilitate the innovation performance (Leih et al., 2015a, Damanpour and Gopalakrishnan, 1998). Despite organisational structure design being considered as the approach to constitute the environment for governing resource

flows (Chen and Fung, 2013), the resources are still required to be well deployed and employed through a purposeful business model (Leih et al., 2015a, Afuah, 2004).

Although the literature provides multiple approaches to depict the correlation and importance between strategy and organisational design (Lawrence and Lorsch, 1967, Skivington and Daft, 1991, Zheng et al., 2013, Poornima Mathur, 2015, Hsiao and Wu, 2020), and strategy and business model (Teece, 2010a, Casadesus-Masanell and Ricart, 2010, Novak, 2013, Slávik, 2017, Priem et al., 2018), the relationship between business model and organisational structure has not fully been explored yet (Leih et al., 2015a, Chesbrough, 2010). Expressly**,** while the business model indicates the architecture to employ and deploy the capabilities, resources and activities (Afuah, 2004, Teece, 2010a, Zott and Amit, 2009), organisational structure is the environment governing the flow of resources and the transactions of innovation. Simply put, the organisational structure design provides an optimal approach to fulfilling the prioritisation of strategic decisions implementation. Thus, a competent organisational structure determines how a firm can facilitate the intended innovation performance (Danupol Hoonsopon, 2012, Dekoulou and Trivellas, 2017, Hsiao and Wu, 2020).

In summary, organisational structure holds a critical role in enabling managers to achieve corporate goals. It governs resources deployment, allocation, and flow corresponding to the way that a business model is designed to configure the capabilities, resources to perform the set of intended activities. Since one of the contemporary managers' challenges lies in stimulating the innovation orientation of both organisational members and processes, firms need to find ways to associate the new business model and the concomitant organisational structure for achieving the optimal rate and speed in the process of adopting the innovation (Damanpour and Gopalakrishnan, 1998). Therefore, the organisational structure needs to be kept innovated to improve itself to better adapt to changes derived from the chosen innovation (Hunter, 2002, Leih et al., 2015a, Damanpour and Gopalakrishnan, 1998).

2.5.3. Interaction between organisational culture and structure

Drawing on the work of Janicijevic (2013), organisational culture has impact upon the design of organisational structure as the process of "legitimisation". Initially, organisational culture formed the interpretative schemes of top managers to shape and select the organisational structure to guide employees' daily work. When a newly designed organisational structure is compatible with the existing organisational culture, the culture will further impact the structure's implementation by imposing the

behaviour and decision of employees in the context of values and norms of behaviours. Furthermore, the long-existing compatibility between organisational culture and structure will create a balance between them and eventually have a more robust and positive influence on organisational performance.

Moreover, the interest in exploring the interactive components of these OC and OS has also arisen among scholars. According to Shelton (2011), a company's organisational structure is determined by the given value (culture) of the top management team. In contrast, different organisational structure types will lead to various impacts on forming organisational culture (e.g., the matrix structure is more favourable in forming an organisational culture than functional structure) (Mao et al., 2016). However, when the context shifts to different situations, the linkage of organisational culture and organisational structure will arguably not have similar impacts on performance. In this debate, research has shown that the relationship between organisational culture and organisational structure is not significant in contributing to knowledge management effectiveness (Zheng et al., 2010) but can be moderated by technology infrastructure towards knowledge sharing (Islam et al., 2015). Another argument, the association of organisational culture and organisational structure is contributing to the implementation of quality management strategies (Wagner et al., 2014). Hence, there are discussions among researchers regarding how organisational culture and organisational structure interact with specific types, for specific pursuits.

Given the importance of the distinctive configuration of organisational culture and organisational structure, Janicijevic (2017) proposed four particular organisational models comprising four multiple sets of element configuration to generate effectiveness in various environmental contingencies. As articulated, these organisational models are autocratic, bureaucratic, innovative, and task model. Each model has a unique configuration of organisational culture and structural types to reach internal harmony. For instance, the autocratic model can be applied by a new enterprise with valuable technology to enable an authoritarian leader to dominate the organisation's operation and strategic choice. A cost-focus strategy usually drives the forming of this model type. In contrast, the equal distribution of power is the essence of the task model. Each part of this organisational model weights equally with its own role to conduct the task. Matured and large organisations compete in the complex but stable environment to apply task model to follow the differentiation strategy. Even though the relationship between organisational culture and organisational structure is looked at as mutual and causal, this interaction will only reach harmony in a particular way.

2.6. Conclusion

By adopting the RBV and DC perspective, the discussion emphasised the existence of multiple business models and the need to explore their heterogeneity and how it impacts value creation, delivery, and capture. Centring on creating a competitive advantage, business model is complementary to technology innovations for providing solutions to fulfil customers' needs; Business model design is the approach to embed innovation to facilitate the technology innovation performance.

Based on the review of the literature, the absence of business model components and how they can be bundled to facilitate innovation performance was addressed as the research gap of this study. So, a working definition was suggested as: *a business model is a strategic choice a company makes to configure and use pertinent capabilities, resources, and activities to compete in the marketplace.* The exploration of business model components and their linkage can explain its heterogeneity and how it can be innovated. In addition, the importance and uncertainty of the interactions between business model, organisational culture and structure have also been addressed.

Finally, distinguishing the heterogeneity of business models determines the success of a firm's developed technology innovation. The theoretical proposition suggested that exploring business model components can help identify the discrepancy in business model configurations. This research finding complements the RBV and DC perspectives by depicting how the VRIN assets can be employed and deployed to create a competitive advantage.

Chapter Three: Model development

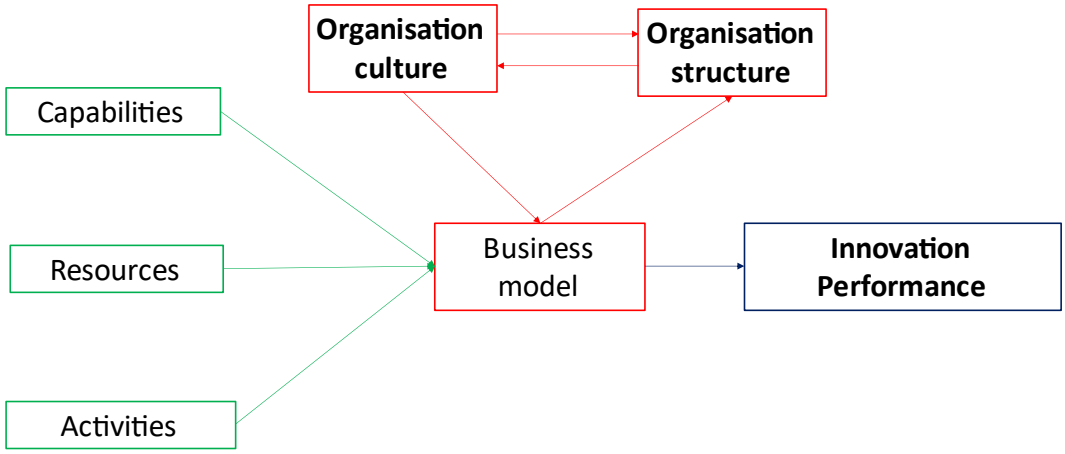
This chapter is devoted to explaining how the research model is developed with theoretical support to establish its measurable characteristics. The proposed conceptual model contains a framework to present the research hypothesis corresponding to the research objectives and questions. The framework grounds the research conceptually and indicates the direction for further investigation.

3.1 Conceptual framework of the study

As mentioned in previous chapters, the purpose of this study is to investigate how companies can use business models to strengthen their sustainable competitive advantage. In this thesis, it is crucial to explore the structure and components of the business model to understand its impact on innovation performance and how it facilitates value capture. Additionally, examining the relationship between the business model, organizational culture, and structure will provide insights into how a business model can be innovated and successfully implemented.

A three-pronged theoretical model is developed to guide the configuration of the business model. The first part explores the business model components in the category of capabilities, resources, and activities. The second part investigates the relationship between the business model and innovation performance. The last part deals with the interaction between the business model, organisational culture, and organisational structure. The conceptual framework is shown below.

Figure 3.1: Conceptual framework of the study



3.2 The business model configuration and components

As highlighted in the literature review, this thesis builds upon the existing knowledge gap concerning how companies can effectively capture the value of their product innovations. The heterogeneity of business models is attributed to the unique configuration and interaction of its components, which in turn influence the outcomes when combined with firms' innovative products. Scholars such as Zott and Amit (2012), Chesbrough (2010), Teece (2010a), and others have recognized the significance of these interactions in shaping the dynamics of a business model and enabling firms to develop and employ innovation product to adapt to environmental challenges. However, despite the presence of multiple business models in the literature, there is still a lack of understanding regarding the specific components and their composition and interaction within different business models, resulting in their heterogeneity (Sosna et al., 2010).

A business model is a strategic approach that helps a company stand out from its competitors in the target market. It encompasses the creation, delivery, and capture of value. Various studies, such as those by Barney (2001a), Morris et al. (2005), Zott and Amit (2010), Richardson (2008), Johnson et al. (2008), Teece (2010a), and others, highlight the overall purpose, operational aspects, and evolution of business models. These studies also present frameworks that outline the architecture of a business model, incorporating different arguments to form its structure. The literature review emphasizes that value creation, delivery, and capture are key factors in a business model, while resources, capabilities, and activities are proposed as the components through which the model can adapt and evolve. However, this general understanding only acknowledges the existence of heterogeneity in business models based on their component configurations. In contrast, when it comes to facilitating product innovation performance, specific components like product innovation, marketing innovation, and process innovation have been identified (DeSarbo et al., 2005, Padilha and Gomes, 2016, Rajapathirana and Hui, 2018). Nevertheless, the specific structure and arrangement of these components within an innovation performance business model remain unclear.

To answer the above question, the working definition: *a business model is a strategic choice a company makes to configure and use pertinent capabilities, resources, and activities to compete in the marketplace.* highlights the construct of business model as capabilities, resources, and activities that underpin the illustration of business model heterogeneity and provides the guidance to explore the list of its contained elements.

According to the business model systematic view, the configuration of business model components implies how they are bundled and the linkage in between to generate the intended performance (Johnson et al., 2008, Richardson, 2008, Zott and Amit, 2009, Bengtsson, 2018). To illustrate, under specific strategic purposes, managers need to design and perform activities to create, deliver, and capture value (Afuah, 2004, Afuah and Tucci, 2001, Zott and Amit, 2010). Hence, the required resources are essential to underpin the execution of activities (Barney, 1991, Richard L. Priem and John E. Butler, 2001, Afuah, 2004) and the particular capabilities are needed for the resources employment and deployment (Zott and Amit, 2010). Following this logic, capabilities, resources, and activities compose the purposeful architecture to contextualise the heterogeneity of the business model on the intended performance. Each of them represents an indicator of business sectors positively affecting the formation and operation of business model. By empirically testing the relationships between capabilities, resources, activities, and business model effectiveness, this study contributes to unfolding the business model configuration. This finding underpins further research on how the business model can be operated by managers and enable companies to enhance their sustainable competitive advantage.

Therefore, this thesis proposes the following hypotheses:

Hypothesis 1: Capabilities will have a positive relationship with a business model.
Hypothesis 2: Resources will have a positive relationship with a business model.
Hypothesis 3: Activities will have a positive relationship with a business model.

3.3 Business model and innovation performance

Centring on the concept of "value", innovation plays an essential role in providing superior customer value as the source of a firm's profitability (Narver et al., 2004, Kwaku Atuahene-Gima, 2005). By creating, delivering, and capturing value, a business model means to commercialise the innovative product to bring an economic return to the firm.

Specifically, it appears that product innovation and business model innovation are two different type of innovation (Markides, 2006, Markides, 2013) but can work together as an alliance (Baden-Fuller and Haefliger, 2013, Markides and Sosa, 2013). Business model indicates an artefact that facilitates the transformation of technology innovation into value for both users and developers (Casadesus-Masanell and Zhu, 2013, Baden-Fuller and Haefliger, 2013). Differently speaking, other than product innovation, the adoption of new ideas also refers to the modification of the deployment of existing assets in order to perform new activities. Thus, the evolution or revolution of business model indicates a novel way to identify, deliver, and transfer the value of innovative products by which various outcomes can be generated (Johnson et al., 2008, Richardson, 2008, Clauss, 2016).

Innovation performance reflects the result of adapting the novel idea into the design, process and distribution of the product (OECD, 2005) and the reconfiguration of assets for implementing new products and/or process activities (Rajapathirana and Hui, 2018, Weerawardena, 2015). Stated differently, business model is the "right way" to constitute the "right things" as the context to commercialise product innovation into market value, and the modification of business model will generate different innovation performance.

Understanding the link between business model and innovation performance enriches academia and business leaders' comprehension of factors influencing firm success. It grounds the notion of business model heterogeneity and emphasizes their role as enablers of diverse innovation performance outcomes. This perspective encourages organizations to actively tailor their business models to foster sustained competitive advantage through innovation. Thus, the following hypothesis is proposed

Hypothesis 4: Business model will have a positive relationship with a company's innovation performance.

3.4 Business model, organisational culture and structure

In terms of enabling companies to achieve success in the market, the extensive discussion has been centred around their competitive advantage (Porter, 1985, M.Porter, 1990, Barney, 1991, Barney, 2001b, Powell, 1992, Christensen, 2001, Klein, 2011, Madu, 2012, Li and Liu, 2014, Kuncoro and Suriani, 2018).
To realise how the organisational culture and organisational structure impact innovation and the subsequent performance, this section focuses on investigating the relationship between organisational culture, structure, and business model to create a competitive advantage.

Business model is the approach to deploy and employ the assets by which the value could be created, delivered, and captured in a unique way (Teece, 2010, Teece, 2018, Foss and Saebi, 2016, Markides, 2013). Organisational structure contributes to a firm's competitive advantage by governing its business model implementation (Chen and Fung, 2013). Regarding the source of competitive advantage, organisational culture determines the company's decision of adapting to environmental challenges (Olson et al., 2005, Klein, 2008, Klein, 2011). However, despite the predominant functions of these three artefacts, the way they interact with each other remains unclear.

3.4.1 Organisational culture and business model

Organisational culture enables firms to recognise opportunities, adopt innovations to adapt to environmental change (Olson et al., 2005, Klein, 2008, Klein, 2011). Organisational culture indicates the values, shared assumptions, and norms of the company that employees can follow (Schein, 1985). Various organisational types facilitate the diverse strategy formation accordingly (Klein, 2011, Boyce et al., 2015). In order to establish or enhance a company's competitive advantage, a company needs to adapt to external change better to improve its business performance (Bodlaj, 2010, Neely, 1998, Afuah, 2004, Teece, 2010a). Hence, given the importance of innovation, companies can act differently than their competitors (Damanpour and Gopalakrishnan, 2001, Afuah, 2004, Porter, 1985).

For performing activities, organisational culture guides a company to proceed with resources-recombination (Chirico and Nordqvist, 2010) and governs the process of transferring the resources into action's outcome (Fiol, 1991). Moreover, a diverse culture will contextualise innovation performance by enhancing the organisation's internal coordination in alignment with strategic objectives (Peteraf, 1993, Erosa, 2012)

to create value (Muratovic, 2013). In other words, organisational culture positively affects the resources-recombination process (dynamic capabilities) by identifying the value creation opportunities to sharpen, adapt, and renew the business model (Achtenhagen et al., 2013). Therefore, when centring around the notion of deploying resources to create value, we argue that organisational culture can positively affect the business model's formation and implementation to facilitate innovation performance. As such, the following hypothesis is developed:

Hypothesis 5: Organisational culture will have a positive relationship with a company's business model.

3.4.2 Business model and organisational structure

Organisational structure governs the working environment for the required resources to be used to perform the designed activities and to consider the intertwined relationship between organisational structure and capabilities (Leih et al., 2015a). While the configuration of capabilities, resources and activities constitutes a business model, meaning to facilitate the innovation performance, the business model cannot be implemented solely (Chen and Fung, 2013, Skivington and Daft, 1991, Dekoulou and Trivellas, 2017). The organisational structure will help managers better deploy and employ the resources to apply innovation (Damanpour and Gopalakrishnan, 1998, Hunter, 2002).

Specifically, a company needs to be innovative to change its business barriers to recognise new business opportunities, and the organisational structure will be changed accordingly (Leih et al., 2015a, Teece, 2018a, Zott and Amit, 2007). By adopting the working definition of business model in this thesis, business model becomes the architecture to employ and deploy the capabilities and resources to perform a set of intended activities (Afuah, 2004, Teece, 2010a, Zott and Amit, 2009), and organisational structure means to govern the flow of the resources, the performing of the activities and the transformation of the innovation into an outcome. In short, organisational structure needs to be dynamic to enable the new business model's implementation; it is rational to contextualise that the company's chosen business model determines how the associating organisational structure is designed (Damanpour and Gopalakrishnan, 1998, Hunter, 2002). This leads to the following hypothesis:

Hypothesis 6: Business model will have a positive relationship with a company's organisational structure.

3.4.3 Organisational culture and organisational structure

The relationship between organizational culture and structure is interconnected. Janicijevic (2013) suggests that top managers rely on organizational culture to shape the organizational structure and guide employees' daily work. Shelton (2011) adds that the founder's personality and the company's values/culture influence the design of the organizational structure. However, this interaction is mutual and two-sided. When organizational structure operates in alignment with the existing organizational culture, it impacts and modifies the culture through a process known as institutionalization. This is done by focusing on organizational balance to enhance performance and acknowledging the influence of culture on the structure as a legitimization process (Janicijevic, 2013).

Other than the interaction between organisational culture and structure, the literature also addresses the particular set of "interactive components." This indicates the means to impact the intended performance (Zheng et al., 2010, Wagner et al., 2014, Islam et al., 2015). Hence, according to the given perspective, we argue that the relationship between organisational culture and organisational structure is mutual and twofold.

Hypothesis 7: Organisational culture will have a positive relationship with a company's organisational structure.

Hypothesis 8: Organisational structure will have a positive relationship with a company's organisational culture.

Table 3.1: Summary of the hypotheses to be tested.

Hypothesis 1:	Capabilities will have a positive relationship with business model.
Hypothesis 2:	Resources will have a positive relationship with business model.
Hypothesis 3:	Activities will have a positive relationship with business model.
Hypothesis 4:	Business model will have a positive relationship with a company's innovation performance.
Hypothesis 5:	Organisational culture will have a positive relationship with a company's business model.
Hypothesis 6:	Business model will have a positive relationship with a company's organisational structure.
Hypothesis 7:	Organisational culture will have a positive relationship with a company's organisational structure.
Hypothesis 8:	Organisational structure will have a positive relationship with a company's organisational culture.

In summary, the tested hypotheses directly address the objective of elucidating how managers can strategically configure their business models to bolster technological innovation performance. Through rigorous testing, the findings underscore the pivotal role of value capture in fortifying a firm's competitive advantage, thereby offering valuable insights for both academia and industry practitioners alike. Furthermore, the examination of the above eight hypotheses sheds light on the evolution and innovation of the business model, transitioning from a mere mediator to a potent enabler of different innovation performance, thus emphasizing the proactive nature of company adaptation in today's dynamic business landscape.

Chapter Four: Methodology

Following the conceptual framework development, this chapter is devoted to discussing the methodology of this thesis. First, the philosophical perspective is developed to justify the research design. Second, an explanation of why a mixed-methods approach has been adopted to investigate and examine the research hypotheses is offered. The third section identifies the target participants for this study by introducing the developed sample frame and research instruments with justifications and expectations.

4.1 Research paradigm

Considering different views on reality (ontology), positivism believes that God's given world is the logical existence, which operates in alignment with universal principle (Crotty, 1998), and which is independent and objective from social actors (Saunders et al., 2009, Crotty, 1998, Johnson, 2000, Wahyuni, 2012). By contrast, the interpretivist view considers subjective perspectives from human cognition as the approach to construct reality. Epistemologically, given the consideration of "causation", observing existing phenomena is one of the positivist's concerns to understand the necessary causality of independent objects with measurable identification. An interpretivist considers "causation" to be the interpretative understanding of social action indicating the antecedents contributing to the emerging phenomenon (Crotty, 1998). When in the axiology view, positivists hold an objective position outside the logical world as value-free observers while conducting verification (Hunt, 1994, Johnson, 2000), and interpretivists care about the perspective of both the researcher and the participants in understanding any social phenomenon (Hunt, 1991). In brief, by analysing the viewpoints in different dimensions, positivists can only accept the absolutely logical result derived from observing the fact; however, interpretivists adopt subjective cognition from humans while conducting the research.

Drawing on the work of Deshpande (1983), the quantitative method means to verify the fact and cause-related relationship of the social phenomenon with objectivity. Meanwhile, studying human behaviour involves the researcher's subjective perspective in the qualitative paradigm. Marsden and Littler (1996) analysed the characteristics of positivism and interpretivism by comparing the individual focus of each in the sense of consumer perspective. For example, positivism aims to look at the causality of the product development process, it is methodological and can bring out the technical factors to achieve customer satisfaction. By contrast, exploring the meanings behind new products interpreted by a consumer is what the interpretivist emphasises. However, while the researcher focuses more on exploring the fact and cause of certain kinds of performance, the quantitative method is applied frequently for acquiring objective and statistical evidence to describe the existing social phenomenon (Abanis Turyahebwa, 2013, Chan Hung Ngai and Ellis, 1998, Matear et al., 2002, Zott and Amit, 2007, Wang et al., 2015, Gkypali et al., 2017).

Positivism explores constant relationships and repeatable general principles, while addressing all the given data and the reality that exists and that operates independently from human cognition. Since this research predominantly aims to explore the objective

truth by finding the significant drivers of innovation performance, positivism offers support to underpin this attempt. However, apart from exploring the relationships between business models and innovation performance, outlining the comprised elements of these schemes is also part of this study.

Even though positivism provides a proper foundation for this research, the absolute objective view neglects all the factors relating to human cognition and social structure. Clark (1998) addressed post-positivism to reinforce the limitations of positivism by recognising that there are multiple ways of inquiring into reality. In short, this perspective acknowledges that the involvement of human knowledge provides value in pursuing the truth logically and scientifically as indirectly perceived data (Johnson, 2000, Crotty, 1998, Clark, 1998). 0621

This research aims to explore general principles according to the positivist's primary pursuit. However, the post-positivism perspective enlarges the flexibility of the investigation by accepting subjective cognitive factors for the demanded research approach to answer the research questions. In addition, post-positivism is addressed as the theoretical position that can increase the accuracy of a mixed methods approach due to its acceptance of both situational and contextual data (Henderson, 2011). Therefore, post-positivism adequately underpins the research design that corresponds to the research objective. By adopting this philosophical stance, this investigation will first justify the themes (theoretical constructs) and identify their comprised elements (observable variables), and then examine the relationship between these constructs (latent variables) with objective (statistical) evidence.

4.2 Research design

This research adopts a mix-methodsto uncover the factors that give companies a competitive advantage in consistently capture value from their innovations. To achieve this, it is crucial to investigate the configuration of the business model and explore its individual components (observable variables) to identify the innovation performance business model. Additionally, a closer examination of the variations in business model configuration will shed light on how business model operates to generate various outcomes. In addition, since the organisational structure and culture are argued to affect business model's innovation and implementation, their influential variables are also in need to be depicted for learning how they interact with business model in different regions. After identifying the observable variables, the following stage will proceed to examine the relationship between the latent variables (BM, OC, OS, and IP). Thus, this research attempts to be constructed and administered through a mixed methods approach to first explore the affirmed business model elements from the subjective experience and then conduct the questionnaire survey to collect the objective data.

In terms of the research purpose, three significant studies have been carried out as exploratory, descriptive and explanatory (Saunders et al., 2009). Exploratory study seeks insights into the concealed phenomena or aims to clarify an understanding of the problems (Saunders et al., 2009). Exploratory research provides flexibility to initiate a study broadly and then progressively narrow it down to reach the focus and form the research objective (Adams and Schvaneveldt, 1991). By comparison, descriptive studies are grounded in the attempt to accurately understand an existing phenomenon by finely delineating the profile, person, and situation (Saunders et al., 2009). Simply put, the descriptive means is more likely to be the precursor of the explanation or the approach to an end. Nevertheless, when studying a cause-and-effect relationship between variables, the explanatory research is the approach to be utilised since it emphasises studying the situation to explain the relationship between variables (Saunders et al., 2009, Malhotra and Dash, 2011). Therefore, to meet the research objectives of this thesis, exploratory and explanatory methods will be adopted as the underpinning approach to design the method of this research. Differently put, the qualitative data collection means to reach the nature of business model and explore its variables in the context of facilitating innovation performance. The following quantitative survey is essential for the statistical test to explore the correlation reflecting the relationship with objective evidence.

The mix of different techniques will benefit a researcher to ease the method effect and eventually lead to greater confidence in the conclusion, achieving reliability and validity of this research project (Saunders et al., 2009). Bryman (2006) developed seven reasons for using mixed methods: triangulation, facilitation, complementarity, generality, aid interpretation, study different aspects, and solve a puzzle. The given reasons adequately support the employment of the mixed methods approach in this research. As an illustration, triangulation, facilitation, and complementarity give the research more confidence in providing multiple views to describe the research findings. Meanwhile, generality, aid interpretation and studying different aspects underpin the building of this project's context in a rigorous way. Moreover, solving a puzzle can answer the research questions as it initially reveals unexplainable results before administering the survey.

Adopting a mixed-methods approach indicates the application of both qualitative and quantitative data collection techniques and analysis in one study. A parallel mixed methods indicates that both quantitative and qualitative are employed in the same stage to conduct the research at the same time. On the contrary, sequential mixed methods means to apply these two approaches in priority (e.g., qualitative interview followed by the quantitative survey), and accordingly analyse the given data emerged in its belonging stage to form the context of the investigation (Saunders et al., 2009). In this case, the researcher can employ interviews as the exploratory studies to obtain the participants' perspectives before collecting the explanatory data through a questionnaire survey (Tashakkori, 2003). The treatment of the two-phase investigation will be described in the following sections.

The first stage of the qualitative interview approach aimed to gain an in-depth and holistic understanding of the insight of business model characteristics by exploring its configuration, purpose, and moderators. For this goal, the investigation was designed to cover business models, innovation performance, organisational structure, and organisational culture to explore the non-numerical data. Thus, a semi-structured interview with a list of themes and questions benefited the research when aiming to access qualitative data to contextualise the quantitative survey (Saunders et al., 2009).

In the application of the qualitative interview, the investigator conducted 25-35-minute interviews (face to face/telephone) and generated 12 sections of questions for the participants. After the main question was addressed, if the participant's response did not provide adequate detail to the explanation or exploration of the question, the investigator generated a further probing question to obtain further insights into

participants' perspectives. This stage aimed to understand the intent of these variables (Business model/Innovation performance/Organisational structure/Organisational culture) and justify the items/observable variables that should be asked in the second stage's structured interview (quantitative method).

The subsequent quantitative survey examined the relationship and causality of these constructs (latent variables) by employing the relevant items (observable variables) into the conceptual model. The quantitative questionnaire was administered in the form of an online survey to reach the target participants (company strategy-makers) working by employing research institutes. In this stage, the survey was conducted as a cross-national study (the United Kingdom and Taiwan) to do the comparison of east and west culture (Ackermann et al., 2015). Further details of the research participants will be presented in the following chapter.

4.3 Research subjects/participants

This research was associated with a two-phase treatment, and the qualitative and quantitative data were collected in turn to meet the requirements of exploratory and explanatory studies. Hence, the target subjects were divided into qualitative interviewees and quantitative questionnaire responders. However, the characteristics of these two-stage participants were identical.

High-technology companies was defined as: “emphasise invention and innovation in their business strategy, deploy a significant percentage of their financial resources to R&D, employ a relatively high percentage of scientists and engineers in their workforce, and compete in worldwide, short-life-cycle product markets” (Milkovich, 1987: 80). Adopting this definition and the derived criteria from the relevant studies (Collins and Smith, 2006, Atuahene-Gima and Murray, 2004, Aslani and Mohaghar, 2013), we framed the sampling of the industries under examination as follows:

- Telecommunications,
- Information technology consulting,
- Semiconductors,
- Automation,
- Medical equipment,
- Pharmaceutical and biotechnology,
- Subassembly,
- Advanced materials,
- Computer software and hardware,
- Renewable energy.

Secondly, the protocol of the start-up companies and existing companies (corporations) are distinguished in how they obtain and implement resources. The criteria examined are First of all, does financial funding come from external or internal sources? Secondly, does the ownership of the company consistent with the professional manager? Thirdly, are the holding resources competent to support the attempted innovative product commercialisation? (Freeman. John, 2007, Shrader and Simon, 1997, Tenbrink and Gelb, 2017). In addition, we also address B2B and B2C companies in our consideration in the type of business transaction: Firstly, B2B: The demand for a product or service is derived by the demand from the participants’ customers. Additionaly, B2C: The demand for a product or service is primarily driven by the specific tastes or preferences of the buyer (Lilien, 2016).

Thirdly, in order to respond to the research objectives, the qualitative interviewees and quantitative survey responders are framed as a company's senior representative (strategy maker) with good knowledge of the company's product and process innovation (Yam et al., 2011), such as president, general manager and C-level executive (e.g., CEO,COO,CMO) (Subramaniam and Youndt, 2005, Wang and Han, 2011, Atuahene-Gima and Murray, 2004, Lang et al., 2012, Lin, 2012, Wilden and Gudergan, 2014, Bucherer et al., 2012, Hansen, 2014). Moreover, it was found that innovative products and processes are significantly affected by the organisational culture but not by the organisation's size (Padilha and Gomes, 2016). Thus, we obtained research participants from different regions to conduct a comparison in this study (Adam, 2016).

As for the phase one qualitative interview, the relevant literature suggested that there should be a range of participant numbers from nine to sixteen (O'Connor and McDermott, 2004, Griffin et al., 2009, Patrick McLaughlin, 2008, Wilden and Gudergan, 2014). In our qualitative research, data were collected from 12 high-technology strategy makers. Meanwhile, to examine the organisational effect towards business model and innovation performance in diverse regions, America (Sharda and Miller, 2001), Europe (Wagner 2012,Sagiv 2007), and the Pan-pacific area (Hahn 2015,Wei 2011, Zheng 2010) are adopted to form the context (west and east culture) for our data collection (Dahlgaard et al., 1998, Lok and Crawford, 2004, Ackermann et al., 2015). The composition of the target participants in terms of business transaction is described below:

Time in the market	**Transaction**	**Number**
Existing company	B2B	3
Existing company	B2C	3
Start-up	B2B	3
Start-up	B2C	3

After the context has been delivered from the phase one results, the phase two quantitative will adopt the same frame on selecting the participants to conduct the questionnaire survey. To reach the investigation credibility, a sophisticated sample size is required, and one of the recommended approaches is determined by taking the same size as the average for samples for similar studies (Tull and Hawkins, 1990). Hence, this study aims to reach 200 to 220 participants by following the sampling size suggested in similar studies (Adam, 2016, Padilha and Gomes, 2016, Naranjo-Valencia et al., 2017). Further details of the qualitative and quantitative research will be discussed in the following chapter.

4.4 Research ethics and confidentiality

In Oct 2019, the initial ethics application for qualitative research was submitted to Strathclyde University, receiving approval from the department at the same month. The qualitative interview proceeded with adherence to ethical considerations outlined below. Subsequently, the findings from the qualitative phase informed the design of the second quantitative research, which followed the same ethics approval procedures. The approval for the quantitative phase was submitted in March 2021 and finalized by April 2021.

Key Ethical Considerations:

Informed Consent: Detailed information about the study's purpose, procedures, risks, and benefits was provided to all participants, who provided voluntary consent and were assured of their right to withdraw at any time.

Confidentiality and Privacy: Measures were implemented to safeguard the confidentiality and privacy of participants' data throughout the research process, ensuring that collected data were accessible only to authorized personnel.

Protection of Participants: Steps were taken to minimize potential harm or discomfort to participants, particularly vulnerable populations, with the research design crafted to mitigate risks and ensure ethical treatment.

Compliance with Regulations: The research was conducted in full compliance with relevant laws, regulations, and institutional policies governing research ethics, with institutional review board approval obtained prior to data collection.

This ethics section highlights the commitment to upholding ethical standards, ensuring research integrity, and maintaining trust with participants. Adherence to ethical principles and guidelines contributes to the advancement of knowledge while respecting participants' rights and well-being.

Chapter Five: Introduction of Qualitative Analysis

This chapter focuses on describing how the qualitative data is collected and analysed. The chapter starts by introducing the design of the research instruments; a semi-structured interview is adopted to develop the interview questions. The second section presents the process of data collection by depicting the criteria and approach of the participants, as well as the obstacles that occurred during the investigation. An analysis of the data is shown in the third section covering the topic of the data transcription, analysis procedure, and deductive and inductive analysis. These analysis approaches are meant to give a sense of the developed conceptual framework and enrich its body by exploring the items (observable variables) and describing the relationship between constructs (latent variables).

a

5.1 Qualitative research instruments

In terms of interview types, there are structured, semi-structured and unstructured interviews distinguished by how they are formalised and structured. The structured interview is framed by following a predetermined and standardised or identical set of questions. That is to say, this approach has the interviewees administrate the questionnaire by themselves and respond in a pre-coded answer for the researcher to collect quantifiable data. Comparatively, semi-structured and in-depth interviews are non-standardised and are primarily used in qualitative research approaches. In-depth interviews are usually entirely unstructured and aim to explore the in-depth general ideas by having the interviewees talk freely. Semi-structured interviews carry the research objectives and themes to constitute questions for the researcher to explore the given nature of an event (Saunders et al., 2009).

The complementarity and generality characteristics of the mixed-methods address the fact that qualitative research aims to collect non-numerical data to contextualise the main quantitative study (Saunders et al., 2009). However, an in-depth interview is not the approach that allows a clearly focused discussion on issues regarding the research objective (Robson, 2002, Easterby-smith, 2008). Thus, in this thesis, a semi-structured interview was applied to undertake the first phase of the investigation to explore the composing elements of the business model, organisational culture and structure, and the indications of innovation performance.

In consideration of research reliability, overcoming data quality issues is critical to avoid interviewer and response bias (Saunders et al., 2009). This concern reflects on the approach to questioning by conducting the following: Firstly, the questions were phrase in a clear, neutral, and straightforward way; In addition, the theoretical terms were not used in the questions; and thirdly, the critical incident technique (activity or event) was embedded into the questions. In addition, since this investigation was a cross-national study, the questionnaire was translated into Chinese for the application of Mandarin speaker interviewees, and 4. The length of the questions was managed to be no longer than 35 minutes to motivate the participants' engagement in this investigation (Saunders et al., 2009).

The research instruments (interview questions) were developed based on the research objectives meant to answer the research questions. By considering the administration of the semi-structured interview, the questionnaire was designed to combine the open questions followed by the probing questions. To elicit the attitude and the experiences

reflecting the facts from participants, the open questions were the means to encourage the interviewees to give extensive and developmental answers by asking questions such as:

> *Many companies and managers talk about their 'business model'. Yet, different people give different meanings to 'business model'. Could you please help me to understand, in your view, what does a business model mean? (What is a business model?)*

The following probing questions were designed and listed to be incorporated into the research objectives and subjects to seek details and explanations related to the research hypothesis (samples are presented below.)

> ** Could you kindly describe, in your opinion, what is business model?*
> ** Could you further describe the role of business model while a company is getting the start or operation of its business? If that is important? Why?*
> ** How do you identify if a business model is successful or not?*
> ** Among all the given information, could you share your own definition of business model?*

For collecting the required data, the questionnaire consisted of four sets of questions, each reflecting a specific theme. The first part, as the warm-up questions, was meant to initiate the interview by eliciting the interviewee's basic information. The second part focused on the themes of the essence and the configuration of a business model. Five open questions and 11 probing questions (allocated by subjects) were addressed in this section associated with three points: Firstly, to explore the meaning/importance/aims of business model, Furthermore, to explore the components of business model, and thirdly, To explore what drives a company to adopt a specific kind of business model. Obtaining data on innovation performance was drawn from part three with the questions designed as follows: In the first place, to explore the meaning/influence/truth of innovation, Moreover, to explore the types of innovation performance, and finally, to explore what facilitates innovation performance. The final part was about assessing the impact of organisational culture and structure on business model towards innovation performance. Three open questions were applied to learn: 1. the role and influence of organisational culture and structure on how a business model impacts innovation performance, and 2. how the specific organisational culture and structure affect business model on facilitating innovation performance. In addition, to conduct the interviews with efficiency and effectiveness, the predictor variables were

collected from the literature in terms of capabilities, resources, activities, organisational culture and structure, and innovation performance as a reference for the interviewees. The qualitative interview guide is presented in Appendix B.

After developing the interview questionnaire, three senior business school PhD researchers from the strategy, organisation management and marketing departments were asked to verify the questions. Their given comments were cautiously applied to improve the sentences of the interview instruments before they were launched. The next chapter will explain the process of the qualitative data collection.

5.2 Qualitative data collection

The qualitative data collection took place from October to December 2019. As mentioned in the previous chapter, this phase-one investigation aimed to reach 12 high-technology company strategy makers (CEO/COO/Founder/High-level manager, etc.), who were expected to be responsible for their decisions and the business responsibilities. The recruitment of this sort of participants was made possible through the investigator's professional network. More specifically, some participants were the investigator's acquaintances, and others were reached through referrals.

An introductory email (Appendix A) was sent to the potential participants in early October 2020 with the information of the research background, purpose, and the importance of this study. Other than the basic description, the participants were reassured that this investigation was 100 percent for academic study only. None of the participants' personal information or shared perspectives (raw data) will be released to anyone except the research investigators. Moreover, the participants' option to withdraw from the investigation at any point of the time during the interview was emphasised. This option was meant to establish mutual trust between the participants and the investigator and encourage them to provide honest answers in the interview. In addition, the participants were promised to be the first to receive the research results once the findings had been explored and validated.

By following the designed frame, 21 invitations were sent by email, and communication tools (Skype, Line, WhatsApp, WeChat, etc.) to reach the existing and start-ups high-technology company covering B2B and B2C in the regions of America, Europe and the Pan-Pacific. Some 14 strategy makers agreed to give their time to engage with this investigation; 12 were chosen in consideration of reaching the quantity balance of the start-ups and matured corporation.

The details of the participants are shown in Table 5.1.

Table 5.1: Qualitative interview participants.

Code	Time in the market	Type	Industry	Region	Working position	Interview Type	Interview time
A1	Existing company	B2B	Computer Hardware	TW(Pan-Pacific)	BU Director	Telephone	12th Nov 2019 08–09
A2	Existing company	B2B	Electronic	IT (Europe)	President	Telephone	10th Nov 2019 11–12
A3	Existing company	B2B	Automation	TW(Pan-Pacific)	COO	Telephone	12th Nov 2019 07–08
A4	Existing company	B2C	Consulting	TW(Pan-Pacific)	Tech-Head	Telephone	6th Dec 2019 06–07
A5	Existing company	B2C	Computer Hardware	TW(Pan-Pacific)	BU Director	Telephone	27th Nov 2019 07–08
A6	Existing company	B2C	Energy	UK (Europe)	Consent manager	Face to Face	13th Nov 2019 13–14
A7	Start-up	B2B	Telcom/ Material	USA (America)	COO	Telephone	17th Dec 2019 13–14
A8	Start-up	B2B	Semiconductor	TW(Pan-Pacific)	President	Telephone	19th Nov 2019 18–19
A9	Start-up	B2B	Consulting	UK (Europe)	Director	Face to Face	20th Nov 2019 10–19
A10	Start-up	B2C	Pharmaceutical	SE (Europe)	Founder	Telephone	3th Oct 2019 09–10
A11	Start-up	B2C	Advanced materials,	USA (America)	CEO	Telephone	4th Nov 2019 13–14
A12	Start-up	B2C	Automation	USA (America)	Founder	Telephone	19th Nov 2019 13–14

During the interviews, participants were questioned individually, either face-to-face or via communication technology (e.g., Skype, Line, WhatsApp, WeChat etc.). Twelve sections of questions were generated in the investigation. In general, the participants took two to three minutes to respond to each primary open question. However, a probing question followed the primary one if they did not provide adequate details. For example: In section one questions, we first gave the context of this research by asking: *in your view, what does a business model mean?* This open question encouraged the interviewees to give their idea of business model. Their responses to the question allowed the investigator to learn about their perspectives and attitudes towards the given subjects. More details were also obtained by using questions such as *Could you further describe the role of business model while a company is getting started in its business? If that is important? Why?* By following the defined subject, this probing question enabled the interviewees to deliver more details related to the research questions. Overall, the open and the probing questions aimed to explore the meanings and the latent variables and their content elements (observable variables). All the interview conversations were audio-recorded and saved.

However, the obstacles faced during the interviews were: Firstly, time controlling: despite the interview flow being designed and managed to lead the interviewee to share their ideas with confidence and ease by responding to the questions accordingly, some interviewees attempted to give more information than was expected and occupied the majority of the first half of the time. Fortunately, these strategy makers showed a high interest in these topics and were willing to continue the interview even after the actual timeslot exceeded the scheduled time. The second half questions were associated with the project/case that occurred in their career path, which made their answers more accurate and shorter. Hence, the overall interview time was still manageable to accomplish the reliability of the investigation. Simply put, the overall interview took about 40~45 minutes on average to answer the primary open questions and the probing ones if needed. Secondly, another issue arose in the frequent rescheduling of the appointment. These high-level managers were extremely busy, and the investigator needed to contact them at the earliest possible time to make an appointment for one or two months later. In addition, some of the interviews were stopped in the middle due to contingency, which led to having to reschedule the appointment. This circumstance caused the extension of the phase one interviews period, but the data collection was still conducted in time with a successful acquisition of the required information. Thirdly, language was also a noticeable concern during the interviews. To give participants the comfortable conditions to share their perspectives efficiently with ease and confidence, they were given two options of the language to utilise during the

interview (English or Chinese Mandarin). However, occasionally, the investigator still needed to clarify the question to ensure that the participants comprehended the question and the terms clearly to avoid any possible bias.

In summary, although some unpredictable circumstances occurred in the data collection process, the aim of exploring the meaning and elements of the theoretical constructs (Business model/Innovation performance/Organisational structure/Organisational culture) was accomplished. To identify the questions that should be asked in the second stage questionnaire survey, the data derived from the qualitative method needed to be analysed.

5.3 Qualitative data analysis

In order to proceed with the data analysis, the audio-recorded files needed to be transcribed into actual words accurately, as well as their tone, body language and non-verbal communication (occurring during the face-to-face interviews) (Saunders et al., 2009). In addition, some participants chose to conduct the interview using Chinese Mandarin, so the collected qualitative contents needed to be first transcribed into Chinese, and then into English. The transcription was very time consuming but an unavoidable process. On average, it took four times the time of the interview to transcribe the text (English interview into English text) and six times the length of the interview if including the translation (e.g., 45 minutes interview required 270 minutes to transcribe the Chinese content into English text). After the transcription, the text needed to be reviewed and printed out to ensure that the generated text was accurately reflected ideas and attitudes of the interviewees. Hence, by considering the required time and effort to generate the text, each of the transcriptions were completed within two days after every interview to avoid a backload of audio-recording and associated transcription work. After the interview transcription was completed, all texts were sent to the interviewees for the final checking to ensure factual accuracy. As for those who utilised Chinese Mandarin in the interview, both the Chinese and the English texts were sent over in consideration of avoiding the language-translation bias (Helsper and Gerber, 2012). The approval or the modification from the interviewees refereed the completion of the transcription stage, which allowed the next step of qualitative data analysis to begin.

In order to conduct the data analysis, the way of data framing needs to be identified. Yin (2003) suggested that if the research adopts an existing theory to formulate the questions and objectives, a deductive approach can help to develop a framework based on the theoretical proposition. Put differently, the data analysis can be organised and directed by the research subjects to reach the research aims. On the other hand, the inductive approach involves an exploratory analysis to learn the subjects or issues for the follow-up study.

As mentioned, this thesis developed the conceptual framework to construct business model, examine its impact on innovation performance, and explore its interactions with organisational culture and structure. The qualitative data analysis intends to explore the subjects' meaning and their observable variables in the research method design to contextualise the quantitative survey. Specifically, the raw data were analysed using an inductive content approach to derive the concepts and themes. The following deductive

content analysis helps to test the categories and hypotheses to contextualise the theoretical structure for further investigation.

Inductive analysis

In an inductive data analysis, the raw data were expected to be summarised, grouped, and headed to make the given variables prominent and to highlight the themes corresponding to the conceptual framework. This study applied the procedure suggested by Saunders et al. (2009) in the types of meaning summarising, meaning categorisation, and meaning structuring. In the meaning summarising stage, each of the 12 transcription texts was summarised by condensing the content of each section into one or two sentences reflecting the key points of the large amounts of the collected information. This action was for the purpose of making prominent the principal themes that emerged from the interviews. Meanwhile, these demonstrated points were also utilised to respond to the research objectives by enhancing or examining the developed conceptual framework. Following this procedure, the categorising stage aimed to outline the collected information in the form corresponding to the research objective. In this stage, first, we developed the categories by reviewing the relationships of the existing theoretical framework and the exploring themes derived from the meaning summarising stage. In this process, most of the explored themes were consistent with the theoretical proposition. However, a few themes further provided an explanation of the research hypothesis which brought new topics into the categories. Subsequently, these categories were attached with distinct assortments reflecting the themes to give meaning to the chunk of data. As for the final unitising stage, the collected data were manually sorted by the investigator to link the relevant bits into the category as data units, otherwise known as coding.

Deductive analysis

In a deductive data analysis, data were expected to be summarised, grouped, and headed to make the given variables prominent and to highlight the themes corresponding to the conceptual framework.

The deductive analysis examines the ideas based on the developed conceptual framework. Accordingly, the RBV and DC perspectives were the central view of the investigator to underpin the data coding and categorisation, as well as the suggestion of the relationship of themes.

Hence, the coming deductive analysis was initiated by carrying out pattern matching, which indicates a process to test the adequacy of the conceptual framework as an approach to reach an explanation of the findings. This process means observing if the evidence derived from the qualitative data was consistent with the theoretical proposition (Saunders et al., 2009). Verifying the pattern matching can be associated with testing the relationship between dependent and independent variables. In this case, the interview content approved the impact of business model (independent variables) on innovation performance (dependent variables), which validates this study. Meanwhile, as for the variables of capabilities, resources, activities, organisational culture and structure, the interviewees helped us filter the effective ones from the enormous amount of the predictable variables based on their experiences and perspectives. The given evidence brought the research forward by enriching the framework's content variables and examining the relationship suggested by the literature. However, some headings were revised and refined during the coding process to disclose a more precise approach to the research objectives. Hence, some themes were revealed to reflect the nature of the interviewee's perspective and to deliver explanations of the research hypotheses (Yin, 2003, McClelland, 1998, Saunders et al., 2009).

In summary, the phase one qualitative interviews adequately collected the interviewees' perspectives to underpin the theoretical propositions of this thesis. The accomplishment of an exploration of the variables and the relationship examination enriches the conceptual framework with pattern matching and explanation building. The findings of these qualitative interviews will be described in the next chapter.

Chapter Six: Qualitative findings

This section will present the findings derived from the qualitative data analysis in five aspects as described below: 1. The nature of business model, 2. The content elements of business model, 3. The indication of innovation performance, 4. The configuration elements of organisational culture and structure, and 5. The interactions between organisational culture, structure, and business model.

Each aspect represents the explanation and the examination of the theoretical proposition to contextualise the second-phase quantitative research. Moreover, apart then the given literature, the qualitative findings provide three more hypotheses based on the interviewee's perspectives. The following description will discuss each theme in terms of the implication it addressed toward the research objectives. The findings will provide the perspectives and elements to establish the conceptual framework for the forthcoming investigation.

6.1 The dynamic characteristic of business model

To answer the research hypothesis of this study, the interview questions were developed in four distinct categories. The first category focused on exploring the nature of business model by asking the participants: *What is business model?* After analysing the collected data of this specific theme, all 12 participants shared the view that business model is a dynamic entity that needs to be constantly changed and improved to adapt to market challenges.

For example, the director of A1 pointed out that the evolution of his firm's business model was driven by the "paradigm shift":

> *A new paradigm shift has been created, that is, business applications do not need to be placed in their own home space, but to use the outside space to 'Computing,' this is also the origin of cloud computing. So, it has also caused a significant change in this industry: Many things can be placed on the public cloud outside…hence, business model is definitely important. The company will encounter different challenges at different times, and it will also affect the change of business model (Director of A1).*

That is to say, the market's constant change drove business model innovation. When this change affects the whole business environment and converts the existing business value transaction, the new business process will force firms to evolve their business model to respond to the business environmental challenges or fail to stay in the competition. This view was shared by a start-up medical equipment company's founder (A10), who emphasised that:

> *At this moment, we are doing B to C business, but a 100% B to C is very difficult and expensive; it requires enormous resources. So now, we are also trying to get into the B2B2C model, which means we need to work with the clinic to sell our product (Founder of A10).*

A3's COO explains how the variation of the business model reflects the change of a company's position in the supply chain. He said:

> *I think business model refers to identifying your role in the whole supply chain. For example, sometimes you might be conducting business by passively responding to your customer's request, and sometimes you can be proactively*

reaching the point to differentiate yourself from the competitors by creating a unique model to sell your product. This is my perspective in terms of business model (COO of A3).

He specifically indicated that multiple reasons drove the adoption of their current business model. In addition, the varied business model implies a different set of resources corresponding to the distinct business model's objective. Meanwhile, the president of A2 stated:

We start our business from nothing to our current stage, followed by having economic return…Therefore, big enterprise is needed to find the solution even though it was actually initiated in a very small business…if we are continuing our previous business model, it is all about consuming resources. This means that I am utilising lot of unnecessary resources to achieve my business purpose (President of company 2).

These given perspectives are evidence indicating the elements of a business model's dynamic nature. Especially, a business model evolves like quicksilver to improve its adaptability and convertibility associated with the company's learning capability. Stated differently, the adoption of different business models means the modification of the deployment and use of resources. The details are presented in Table 6.1

Table 6.1: Business model's dynamic elements:

Dynamic BM elements:	Existing company:	Start-ups:
Lesson learned process	A1. A4. A5	A7. A10. A11.
Constantly changing process: Quicksilver	A1. A2. A3. A4. A5. A6.	
Constantly changing process: Adaptability	A1. A2. A3. A4. A5. A6.	A7. A8. A9. A10. A11. A12
Constantly changing process: Convertibility	A1. A2. A3	A7. A8. A9. A10. A11. A12
Resources correspondingly revised	A1. A3. A4. A5. A6.	A10.
Persistency in short term (if successful)	A3. A4. A6	A7. A8. A9. A10. A11. A12
Innovation as the driver	A1. A2. A3. A4. A5. A6	

Based on the 12 interviewees' responses, five points were explored and presented as below:

1. There is no perfect business model, but a competent business model (choice) for helping a company at a particular moment.
2. The managers wouldn't know ahead if the chosen/developed business model will meet the company's expectations until it is tried: To keep trying is the only way to find a competent business model to achieve the company's goal.
3. Innovation is an essential driver in the process of business model design or variation.
4. The variation of a business model will lead to changes in the required resources (capabilities, resources, and activities).
5. The change of a business model aims to keep the company survive (making enough or more profit) in a competitive market.

These points give prominence to business model's dynamic characteristics. Especially, business model evolves like quicksilver to improve its adaptability and convertibility associated with the company's learning capability. Meanwhile, the adoption of the different business models implies changes to the deployment and employment of resources.

Previous research has focused on business model innovation (BMI), and some researchers have suggested that the notion of being dynamic raises a discussion between BMI and a company's success (Lambert and Davidson, 2013, Kim and Min, 2015, Velu and Khanna, 2013, França et al., 2017, Geissdoerfer et al., 2018, Sousa-Zomer and Cauchick Miguel, 2018, Demil and Lecocq, 2010). Others have focused on the drivers of BMI (Mitchell and Coles, 2003, Baden-Fuller and Haefliger, 2013, Mihaela and Amalia, 2017). However, a relatively small body of literature has raised concerns on exploring the BMI mechanism that accommodates and facilitates the dynamic of BMI (Foss and Saebi, 2016, Velu and Khanna, 2013).

A considerable amount of literature has addressed BMI's aim g to explore its impact on enterprises' success (Foss and Saebi, 2016, Sousa-Zomer and Cauchick Miguel, 2018, Lambert and Davidson, 2013, Kim and Min, 2015, Velu and Khanna, 2013, Velu, 2016). For instance, Demil and Lecocq (2010) attempted to divide the static and dynamic business model by introducing the "RCOV" framework. This framework demonstrates the elements of business model as "Resources and Competences", "Organisational structure", and "Value proposition" and subsequently posits that the interactions between these elements create internal effects to alter these core elements as a process of business model evolution. Apart from this endogenous transformation, the internal managerial theological decision and external environmental factors are also

part of the existing business model change (Macro and Micro). The authors called this continuous transformation “Permanent disequilibrium” to reflect the dynamics of the business model. Consequently, the following literature on the notion of business model activities system has highlighted the interdependencies of the business elements. In this perspective, researchers considered drawing innovation into particular articulations of the business model architecture (e.g., content, structure, and governance) or whether changing the business model architecture is the approach of developing a new business model for companies to stay competitive in the market (Zott and Amit, 2012, Zott and Amit, 2010). Subsequently, Lambert and Davidson (2013) studied 69 business models and categorised three themes from their analysis: Business model as the basis to classify the enterprise. The relationship between Business model choice and enterprise success, and Business model innovation potentially improves enterprise performance. Simply put, the dynamic notion of BMI underpins the studies of the relationship between BMI and enterprises' success.

In terms of the dynamics of BMI, an enterprise’s existing years in the industry affects its business model choice. By studying 95 Indian hand-collected data from the financial press, Velu and Khanna (2013) argued that less-dominant companies will take an offensive move to engage in corporations and develop an evolutionary BM before the dominant companies become too large. However, this kind of action will lead the dominant companies to radically change their existing business model and innovate a revolutionary BM as an offensive response to environmental challenges. Thus, the implication of BMI application is relevant to its dynamics by which companies facilitate competitive advantage, sustainability, and the associated success. (França et al., 2017, Sousa-Zomer and Cauchick Miguel, 2018, Geissdoerfer et al., 2018, Zott and Amit, 2012, Teece, 2010a, Chesbrough, 2007)

Within the BMI literature, an interesting tendency revolves around how to innovate a business model and the importance of keeping a business model novel (Zott and Amit, 2007, Zott and Amit, 2012, Gambardella and McGahan, 2010, Johnson et al., 2008, Baden-Fuller and Morgan, 2010, Richardson, 2008, Lanzolla and Markides, 2020). A broader view is progressively established by not solely observing the business model’s endogenous change but also in parallel to conducting longitudinal research to explore the implication of business model transformation (Velu, 2016, Velu and Khanna, 2013). Hence, the dynamic nature of BMI reflects how to employ innovation in the articulations (or elements) within the establishing BM architecture, the way to link these elements, and the BM architecture itself (Zott and Amit, 2010, Zott and Amit, 2012). However, the transformation of business model also requires capabilities (e.g.,

top managements' strategic thinking and the inherited theological decisions). Specifically, the dynamics of business model is driven by external environmental challenges, internal interactions between the elements, and how a company's managers innovatively find ways to deal with the above two changes and proceed with evolution/revolution of their business model.

Based on the first stage of qualitative research, all these 12 companies/participants shared the notion that business model needs to be continuously reviewed and revised either by slight change or extensive modification. The industrial feedback is also consistent with the literature's implication of keeping BMI dynamic. Moreover, most interview participants also acknowledged the demand of pushing their company to stay ahead of their rivals by finding novel and private means to create a unique value of their products. For instance, A2 started transforming its business model 10 years ago. According to its COO, the difference of the technological capabilities and the new product development progress between his company and the industrial rivals are very little, and probably will always be that way. Thus, A2 strategically started the development of another manufacturer process in parallel with their product development in 2010; they endeavoured to gradually remove a sub-section in their production line without sacrificing the quality of products. After a decade's effort, now their investment is paying off. They can lock-up their existing customers by providing an added-value package service (product and process) that their competitors will struggle to replicate for years. However, this established competitive advantage would not always keep them ahead of their rivals:

> *Developing new ways to work with our customers in the form of financial engagement will be our next strategical action to search for the possibility of developing a new business model (COO of A2).*

Another example is an innovative automatic tea-brewer. As a start-up founded in 2017, A11 has been dedicated to inventing a new-to-the-world device that can fast brew tea that tastes like hand-pressed tea. Despite this innovation receiving positive feedback from the market, the hardware sales model showed serious problems as it did not have a continuously profitable approach:

> *Our customers might be willing to pay for this machine, but that is it. To survive, now we are developing our second-generation brewer with some extra functions that can serve the users in other ways than just brewing tea. We have to make money from these services (CEO of A11).*

The above two cases reflect the perspectives of the literature; a business model is a constant process of dynamic change in how a company does business.

The most striking observation to emerge from the data analysis is that the dynamic characteristics of the business model reflect the process of driving the adjustment, evolution or revolution of the set of resources. Specifically, different business models indicate different sets of the required resources corresponding to strategic objectives. Nevertheless, the business model for enterprise success does not merely refer to drawing innovation into the elements, the linkages of the details, or modifications of the architecture. The dynamics of a business model need to be addressed in relation to a company's competitiveness (Demil and Lecocq, 2010, Lambert and Davidson, 2013, Velu and Khanna, 2013, Velu, 2016, Foss and Saebi, 2016). In short, the evidence derived from the interviews and relevant studies leads to a cognate question: how can companies continually find ways to vary their business model to pursue their competitiveness (Foss and Saebi, 2016, Lambert and Davidson, 2013)?

6.2 The innovation type and business model objectives

The 12 sets of qualitative data provide crucial insights into a specific pattern regarding the two types of innovation objectives and how these are relevant to a company's business model. In the interviews, respondents were asked to elucidate the pursuits of their business model. In response, all participants indicated that more than one business model had been adopted in their experience. However, a surprising and striking observation to emerge was that all these descriptions were related to two themes: 1. a focus on promoting existing technology with slight changes in products, or 2. a brand-new technology/product requiring an entirely new way to be introduced to the market.

For example, in response to the question: *How do you identify if a BM is successful or not?* the COO of A3 said:

> *…the ways to identify the success of the model are, 1) This model can be operated in the market for a period and cannot be imitated by rivals easily, 2) This model shall be able to be constantly transformed in stages for firm staying ahead than others…along with the improvement of our technology and service capabilities, we might vertically or horizontally extend our business to other sections of the supply chain for engaging more with our customer in multiple aspects. In other words, the bonding between us and our customer will be more intensive. In this way, we are lifting the barrier of this business model for our competitors to enter (COO of A3).*

This sharing depicted that A3's business model was meant to keep it stay ahead of its rivals. Moreover, this business model was designed to lead the product improvement in alliance with the process innovation to enhance their existing customers' engagement. In the meantime, the A5's director explained how this PC leading company remains in its position in the market:

> *PC is already a very mature industry, so our business model focuses on finding ways to improve our product for making profits. In recent years we have tried to find a unique point in the product to enlarge the particular segment and sell the product better with the corresponding profit. For example, 'Gaming'. But when we enter the e-sports section and start to harvest the results, other competitors would also jump in to share the business. So, we also need to keep developing other new segments such as the 'Creator serious' PC products to bring in profit. This is our current core business model (BU director of A5).*

When A12 (robot developer) aims to introduce a brand-new product to the market, its founder gave us his idea of business model success:

> *Business model serves us by telling us where to put our resources, where we are going to make money, and how we are going to make money…also, that will be a very cool thing to change the way of people learning sports. In the old times, they must take classes in university, or find some people around them. Now since this tutorial (with robot) is all online, you are no longer restricted by geographic limitations (Founder of A12).*

In addition, the CEO of A11 also addressed his success of BM:

> *Our business model is meant to have our customer understand what our product can do in making good tea and keeping healthy. I want my BM to help me send these concepts to the market…It is more like in what way I can create value to the customer through my tea brewer. Then I might be able to create the demand of the market (CEO of A11).*

By reading the above description, their responses can be sorted out into two main categories. For A3 and A5, they aim to improve their existing products and find ways to increase sales. Comparatively, having the adopted or developed business model to deliver value and even create new market demand from a novel product are the goals of A11 and A13. Concurrently, the 12 participants' description also indicates that the different types of innovation employed in their product designs require various business models to create competitive advantages.

BMI and Product Innovation type.

Recently, there has been an increasing amount of literature that views BM innovation as a form of innovation (Diacoun., 2014, Foss and Saebi, 2016, Baden-Fuller and Morgan, 2010), which is distinguished from but can work alongside product innovation to create a company's competitive advantage (Zott and Amit, 2012, Zott and Amit, 2007, Teece, 2010a, Chesbrough, 2007). However, the arisen argument is: in what way can a business model be innovated for the companies to acquire the performance from their developed technological innovation (Baden-Fuller and Morgan, 2010, Baden-Fuller and Haefliger, 2013) .

The generalisability of the BM and BMI can be distinguished into two streams: The

central context of the application of BMI, and The typological dimension depicts the configuration of BMI (Baden-Fuller and Morgan, 2010). In the second stream, BMI indicates a value system that enables managers to reach multiple ways to view, propose and monetise technological innovations (Teece, 2010a, Chesbrough, 2007, Zott and Amit, 2012, Baden-Fuller and Morgan, 2010).

To date, several studies have investigated innovation and addressed its various types (OECD, 2005, Damanpour and Aravind, 2012, Christensen, 1997, Markides and Geroski, 2004). Among these innovation types, radical and incremental innovation are considered to be the indications that describe the nature of technological change (Markides and Charitou, 2004, Damanpour and Aravind, 2012). To illustrate, “Radical innovation" refers to 1. Create new-to-the-world products (new value proposition) that disrupt existing consumer habits and behaviours and 2. the markets that they create undermine the competencies and complementary assets on which existing competitors have built their success (Markides and Geroski, 2004)). On the contrary, “Incremental innovation” is about extending the current proposition and existing activities, enabling firms to continue to do what they are currently doing, only a bit better (Markides 2004). That is meant to improve products for better engagement with existing customers (Christensen et al., 2018, Christensen, 1997). Nevertheless, each kind of the innovation types implies a distinct source. As for the radical innovation, the new technology is the supply-push force to stimulate the emergence of entirely new products and markets (Baden-Fuller and Haefliger, 2013, Markides and Geroski, 2004). On the other hands, the demand from current customers drives existing products to be improved (incremental innovation) (Markides and Charitou, 2004). Differently put, these two kinds of innovation are two approaches meant to generate different results based on different pursuits. Thus, when looking back to the findings of innovation identification, the respondents’ sharing perspectives constantly reflect the characteristics of radical and incremental innovation (outlined in Table 6.2).

In summary, for the purpose of identifying the source of innovation performance, radical and incremental innovation are the strategic decision of product development to create the companies’ competitive advantage. Moreover, the indications of these two types of technological innovations provide an explanation of the distinct business model configuration and its implications.

Table 6.2 The innovation type of companies.

Innovation types/company type	Existing company	Start-up
Incremental innovation	A3. A4. A5. A6	A7. A8

Radical innovation	A1. A2.	A9. A10. A11. A12

This section points out that different business models engage with varying types of innovation to facilitate the expected performance. From the qualitative interview data, the companies' innovations in terms of product development can be categorised as incremental and radical. Meanwhile, managers will deploy and employ different elements to compose their business model in serving the chosen innovation and the inherited product for the company to be (or stay) competitive in the market.

6.3 The business model framework

By analysing the qualitative data, the companies' strategy makers provide vital insights into business model's nature and outline its configuration. Simply put, business model is a mechanism with a specific framework linking the components to create, deliver and capture value.

In response to the question of "What is business model?" some respondents immediately brought up the concept of value to explain the essential goal of their business model. A4's head of technology, put much weight on the term "value" in his description:

> *…for example, if we are in the specific industry where goods are sold, our business model may have two sources of profit. One is the value of the product itself. The other one is to earn the so-called differentiation of the service, and the value of this difference comes from the process of finding goods or providing relevant information to customers (Tech head of A4).*

The above description distinguishes the value derived from product development and the service. Moreover, he explains the role of the business model being different in existing companies and start-ups:

> *While operating in an existing industry like us, the business model is inherited from the original business environment, and our profit corresponds to the value identified by our customers. However, if a start-up company can destroy the old market mechanism, it is necessary to establish its thinking mode through developing different BMs or providing different values. In that way, a business model may be a weapon for them to enter the market (Tech head of A4).*

Accordingly, the role and activities of a business model vary in different kinds of circumstances reflecting on the way value was created, delivered, and captured. Coincidentally, a further explanation of how "value" is embedded in business model execution can be found in A 9's definition of business model:

> *...you can build the value such as value chain, supply chain, customer chain, and how you fit into that chain. You are either creating the activities or the supplier network. Eventually, it is about people, so it is about your value proposition and how you are going to succeed more than others who might have failed (Director*

of A9).

In brief, the respondents' sharing illustrates the role of business model, which enables the company to develop its value system and the derived competitive advantage. Specifically, the strategy makers employed contrasting elements of value creation, delivery and capture corresponding to their adopted innovation (radical/incremental). More details are presented in Table 6.3 and Table 6.4

Table 6.3 Incremental innovation value system elements:

	Value system elements (Incremental innovation)	**Existing company**	**Start-up**
Create value for customers/mkt	Improve the product/service on the current application (add value)	A1. A2. A3. A4. A5. A6	A7. A8. A10. A11. A12
	Satisfy the existing customer	A3. A4. A5.	
	Optimising the resources deployment	A3. A4. A5	A7.A8. A9.
	Compete to possess the key resources	A3. A4. A6	
	Extension in the supply/value chain section	A3. A5.	A7. A11
Launch/delivery product(service) to the customer (market)	Existing value carrier (product/service/existing TA)	A3. A4. A5. A6	A7. A8. A9. A10. A11
	Value delivery improvement (package /extension)	A3. A4. A6.	A8
Make economic return (profit)	Engaging better with the customers	A3. A4. A5. A6	A8. A9. A10. A11. A12.
	Lifting up the market entering barriers	A3. A4. A5. A6	A7. A8. A9. A11. A12.
	Keep the revenue/profit %	A3. A4. A5. A6	A7. A8. A10.A11. A12.
	The improvement of the revenue structure	A3.A4.A5. A6	A8. A9. A11
	Highly competitive	A3. A4. A5	

Table 6.4 Radical innovation value system elements:

	Value system elements (Radical innovation)	**Existing company**	**Start-up**
Create value for customers/mkt	Envision and correspond to the paradigm shift	A1. A2	A7. A8. A11. A12
	Satisfy the low-E/unmet market need	A1. A2.	A7. A8. A9. A10. A11. A12.
	Optimise the resources employment	A2.	A7. A8. A9. A10. A11. A12.
	Investment/reach on the (needed)resources	A1. A2.	A7. A8. A9. A10. A11. A12.

	Huge leap derived by the new solution	A4.	A7. A8. A10. A12
Launch/delivery product/service to the customer (market)	New value carrier (easier access/New Target audience)	A2.	A10. A11. A12
	New value delivery way (knowledge Sharing/product service integration)	A2.	A9. A10. A11. A12
	Tuning the approach frequently	A1. A2.	A7. A8. A9. A10. A11. A12.
Make economic return (profit)	Facilitating the market change (macro)	A1. A2.	A10. A11. A12.
	Pioneer advantage (draw the market attention)	A1. A2.	A7. A8. A9. A10. A11. A12.
	Takeover the mainstream product	A1.	A7. A8. A10. A11. A12.
	More flexibility of profit range.	A4.	A8. A10
	No economic return in the beginning	A1. A2.	A7. A8. A9. A10. A11. A12.

BMI Dimension and framework

Given the importance of how business model exerts its expected impact on facilitating an enterprise's success, much of the literature focuses on exploring the dimensions and framework of BM innovation or design to explain its diversity (Mitchell and Coles, 2003, Chesbrough, 2007, Zott and Amit, 2012, Pels and Kidd, 2015, Clauss, 2016, Dasilva, 2018, Sousa-Zomer and Cauchick Miguel, 2018).

For example, some scholars focus on how to deliver value to customers and to get paid by doing so. Hence, several dimensions of BMI have been explored as: the "Who", "What", "When", "Why", "Where", " How", and "How much" (Mitchell and Coles, 2003). In addition, Chesbrough (2007) proposed a BMI framework to introduce the path from a primary (undifferentiated) business model to an adaptive platform, and six business model parameters were addressed whereby innovation can be applied to evolve a business model. These parameters are: 1. Value proposition, 2. Target market, 3. Value chain, 4. Revenue mechanism(s), 5. Value network or ecosystem, and 6. Competitive strategy. Zott and Amit (2012) elaborated the elements as 1 The activities that are selected to be performed, 2. The structure to link and prioritise these chosen activities, and 3. The party to perform the activities as the governance system. On the activities system perspective, Pels and Kidd (2015) developed four dimensions; firm-centric, industry-centric, economic-centric and social profit equation. Meanwhile, these four dimensions indicated that BM elements (economic, operational, and

strategic level) determine the business model innovation types (revenue, enterprise and industrial) and the dynamics between these four dimensions and the end-user. Yet, by means of exploring the propensity of effectively paving the way to enable BMI to generate the expected performance, Batocchio et al. (2017) combined the practice of balanced scores and the business canvas to develop a roadmap that can help start-ups assess the performance of their business model innovation. In brief, the existing BMI studies have individually covered the themes of BMI framework, its comprised components, and implications on contributing to the firm's success, yet the generalisability of the given research area is limited to demonstrate a holistic view to answer the question: how does business model exert its expected impact on facilitating an enterprise's success? In specific terms: how do the discrepancies of business models facilitate the innovation performance?

By studying these proposed BMI dimensions and framework, multiple pursuits have been revealed, reflecting on the diverse approaches for managers to employ innovation to design their business models (Clauss, 2016, Batocchio et al., 2017). The given perspectives from the interviewees highlight the role of innovation in value creation, delivery, and capture to create competitive advantages. This idea is consistent with the BMI literature perspective regarding how to enable BMI to exert its performance by applying innovation in various articulations or elements for a company's competitiveness (Mitchell and Coles, 2003, Chesbrough, 2007, Zott and Amit, 2010).

In order to proceed with the measurement of BMI, Clauss (2017) proposed a framework aiming to fulfil the gap in the literature regarding the deficit of a validated measurement scale of BMI for managers, to assess if they are struggling in the most obvious domain (e.g., new product development), and to address innovation instead of embracing a comparative consideration to reach multiple faces of BMI. This framework incorporated three dimensions as value creation innovation, value proposition innovation and value capture innovation and their sub-constructs. With respect to value creation innovation, it is relevant to appropriate the features of product/service and technology to create customer value. This explains that the value creation innovation changes the way of value capture and enables the developed technology to be constantly monetised and profitable (Baden-Fuller and Haefliger, 2013). In addition, the novel way to deliver value to customer can also determine if the proposition of the product/service or technology successfully approaches the buyer as the antecedent of economic return. Moreover, value capture focuses on converting the value proposition into revenue that covers the cost to create profits and sustainable performance. These three dimensions correspond to the perspectives addressed by the

interview respondents.

To sum up, BMI implies a continuous process of addressing innovation in the purposeful framework, the incorporated elements, and the link/allocation of these elements that enables companies to constantly create, propose and capture value in the market. Therefore, the BMI framework developed by Clauss (2016) will be adopted in this thesis as the central structure of business model design to examine the theoretical propositions of exploring multiple business model themes, their configurations and their incorporated components.

6.4 The business model components

This section elaborates on the business model elements according to the interviewee's responses. Through data analysis, the investigator aims to present the observable variables by filtering the literature addressing predictor variables in the sort of capabilities, resources, and activities.

During the interviews, all participants emphasised the importance of resources. For example, the director of A2 defined a business model as:

> *How we invest in our resources to generate the greatest value and obtain the most advantageous position in the market to get the best business opportunities (Director of A2).*

The concept of resources was further introduced as a sort of advantage that enables A3 to keep its competitiveness in the market:

> *…our business model focuses on creating win-win for us and our customer by saving time and resources for our customers (COO of A3).*

Other than the mature corporations, the start-ups placed more weight on the employment of resources. The COO of A10 said:

> *A business model is what kind of resources do you use, especially for a start-up like us, the resources are very limited. In fact, if the company's ultimate goal is to generate profit, the business model is how to find the needed resources and use them to achieve this (COO of A10).*

More details can be found in Table 6.5, reflecting the relationship between the business model and resources.

Table 6.5 BM elements and resources:

BM elements	**Existing company**	**Start-up**
The way to possess and deploy the resources to build competitive advantage	A1. A2. A3. A4. A5. A6.	A7. A8. A9. A10. A11. A12
Envisioning the market change/business opportunities (paradigm shift)	A1. A2. A3. A4. A5. A6.	A7. A8. A9. A10. A11. A12
Create uniqueness of the company	A1. A2. A3. A4. A5. A6.	A7. A8. A9. A10. A11. A12
Innovation embedded	A2. A3. A5. A6.	

Based on the interview findings, the key to create companies' competitive advantages lies in finding ways of deploying and employing resources. Differently put, how to reach, invest and use these resources to face the market challenges requires embedding innovation into the capabilities and the activities. These findings attempt to underpin the investigation and help the managers to choose the necessary assortments to invest in to develop or innovate their business model as a competent approach to their strategic goals.

The BMI literature has focused on how to substantially evolve business model by altering its framework, incorporating components, the way to link these components to facilitate the dynamics of a business model and its derived performance (Batocchio et al., 2017, Mitchell and Coles, 2003, Foss and Saebi, 2016, Lanzolla and Markides, 2020). However, relatively speaking, few studies have been concerned with how the provision of antecedents, moderators, and components of BMI affect the performance derived from strategy accomplishment (Demil and Lecocq, 2010, Foss and Saebi, 2016).

As Demil and Lecocq (2010) argued, BM evolution is involved in responding to external environmental changes and internal factors. The external changes appear in various circumstances such as new aggressive entrants' arrival, the increased of cost of required resources, and the emergence of substitutes. In contrast, interactions of business model's components or managers' decisions will internally drive BM variations. When a business model processes its change, companies start exploiting some activities (e.g., applying new resources, developing new revenue sources, reengineering an organisational process, and externalising value chain activities) to adapt to changes. Meanwhile, this business model modification will lead to an increase or decrease in performance, mostly reflecting on the structure of cost/revenue.

Given the importance of finding ways to enable BMI facilitate the business performance, a question was raised: *Does the new business model necessarily bring better performance than previous ones (Kim and Min, 2015)?* Accordingly, the key for companies to create marginal return lies in whether the incumbents' existing assets complement the early business model or if an autonomous business unit can work to align with the conflicting assets for a new business model's implementation. In short, the determinant of a new business model success is regarding whether the company's holding assets are compatible and adequate to work with the new business model and further facilitate the expected performance.

After performing a comprehensive systematic review of the BMI literature, Foss and Saebi (2016) concluded that there are four literature gaps that scholars should discuss: 1. Defining and dimensionalising the BMI construct, 2. Congruence and identifying antecedents and outcomes, 3. Contingency and moderating variables, and 4. Boundary conditions. In terms of "Defining and dimensionalising the BMI Construct," the fundamental discussion encompasses the notions of to "what" and to "what extent" the innovation shall work to evolve the existing BM. Especially, the authors explored the four types of BMI: evolutionary, adaptive, focused, and complex BMI, and each type of BMI has its own distinctive approach to address innovation. For instance, evolutionary BMI focuses on voluntary changing over time to proceed to "fine-tuning" by altering an individual BM component (Baden-Fuller and Morgan, 2010, Sitoh et al., 2014). Adapting the environmental business model architecture indicates how companies respond to external changes (Nancy M. P. Bocken, 2016). In contrast, focused and complex BMI are not about adjusting the company's existing BM and adaptation of an external BM, but involves partially modular change or entire modification of the company's BM. Hence, the modification of components, architecture, or the substantial model changes implies how innovation helps companies maintain their competitiveness in existing markets or by creating new markets. In addition, based on their review of previous studies, the BMI antecedents addressed in the existing literature need further clarification to reach congruence and identification. In their analysis, this specific term distinguished three multiple aspects as 1. Calling force, such as the response to the environmental (global /business market) competition, 2. Drivers, and 3. The attempt to seize new opportunities introduced by the advent of e.g., new communication technologies and new business models.

By viewing the BMI literature, how to distinguish business model lies in identifying the dynamic emerging within the BMI process or appears in the form of evolution/revolution from one to another (Demil and Lecocq, 2010, Foss and Saebi, 2016, Philipson, 2016). Meanwhile, the design of a BMI framework is intertwined with the strategy making process (Cortimiglia et al., 2016). This perspective underpins the notion that the development of BMI corresponds to the individual strategic decisions of managers reflecting how companies tend to respond to market challenges (Foss and Saebi, 2016, Zott and Amit, 2010). Despite these studies revealing the pulling-force and drivers of BMI, the architecture and components that enable BMI to facilitate a company's' success are vague (Foss and Saebi, 2016). In addition, the concept of BMI has been argued to not necessarily be the best solution for companies to bring better performance if the new BM adaptor (or developer) did not put the compatibility and

complementarity of the holding resources into consideration of serving the new business model (Kim and Min, 2015, Christensen et al., 2016). Moreover, by applying the deliberation of the perspective of BM activities and dynamic capabilities, the components (capabilities, resources, and activities) within the BM framework are interdependent and dynamic (Zott and Amit, 2010, Foss and Saebi, 2016, Lambert and Davidson, 2013). In short, the interactions between and the configuration of these elements determine how this BM (or new BM) exerts its expected effect to meet managerial objectives.

By analysing the participants' responses to the question: *Is there anything that helps you access your innovation performance?* we can outline five points as: 1. The RBV perspective delineates the underpinning framework of the elements to support the development and execution of a business model and eventually build competitive advantage for the firm's sustainability, 2. Capabilities are a means to detect market change, foresee future trends, and deploy, employ and utilise the resources, 3. Resources enable firms to support activities, 4. Activities enable firms to differentiate themselves by providing something unique to their rivals, and 5. Innovation is the driver of new ways of resource utilisation. All these points are consistent with the previous theoretical propositions and underpin the exploration of business model components. Therefore, by embedding the capabilities, resources and activities into the interview content, the respondents' perspectives enable the researcher to flit the business model components from the given data in the context of facilitating innovation performance. The observable variables and their relevant sources are presented in the following three tables (6.6, 6.7, and 6.8).

Table 6.6: The business model elements: Capabilities.

	Scale:	**Source:**	**Number of items**
1	Strategic planning capability	Preda (2012)	5
2	Strategic innovation capability	Preda (2012)	14
3	Product innovation capability	Sok and O'Cass (2011)	5
4	Process innovation capability	Camison and Villar-Lopez (2014)	10
5	R & D capability	Yam (2011)	3
6	Manufacturing capability	Yam (2011)	3
7	Marketing capability	Yam (2011)	4
8	Learning capability	Yam (2011)	3
9	Knowledge sharing capability	Yam (2011)	3
10	Resources allocation	Yam (2011)	4

	capability		
11	Collaborative capability	Wang (2017)	7

Table 6.7: The business model elements: Resources.

	Scale:	**Source:**	**Number of items:**
1	Physical resources.	Bakar (2010)	4
2	Financial resources.	Bakar (2010)	3
3	Human intelligent resources. (Entrepreneurial Orientation)	Bakar (2010)	3
4	Reputational resources.	Bakar (2010)	3
5	Technological resources.	Bakar (2010)	3
6	Human capital resources.	Jegede (2016)	4
7	Networking alliance resources.	Soh (2003)	2

Table 6.8: The business model elements: Activities

	Scale:	**Source:**	**Number of items:**
1	Production innovation activities	Jang (2017)	3
2	Process innovation activities	Ceylan (2012)	3
3	Exploration innovation activities	Athuahene-Gima (2005)	3
4	Exploitative innovation activities	Athuahene-Gima (2005)	3
5	Marketing Entry timing activities	Lilien (1990)	3
6	Open innovation activities	Cheng (2018)	5
7	Front-end innovation activity	Markham,Ward (2013)	4
8	Marketing and sales innovation activities	Ceylan (2012)	3

These elements refer to the components of a business model's configuration. They can innovate spontaneously and form a business model configuration to reflect the evolutionary and adaptive BMI. To sum up, exploring these business model components contributes to the investigation of business model innovation by learning the endogenously spontaneous change of business model components and how these components can be linked and revised as business model reconfiguration innovation. More importantly, exploring these changes will demonstrate business model discrepancies and how they affect performance. By doing so, the investigation aims to elucidate how the business model resources can be configured to reach the compatibility of the business model implementation. In the second-phase quantitative

survey, these elements will be used to investigate the configuration of business models.

6.5 The organisational culture, structure, and business model

The qualitative question was initiated by drawing upon the identification of OC and OS led to an exploration of the elements that underpin BM formation and implementation. The results were meant to endorse further investigation of how OC and OS interact with BM.

6.5.1 Organisational culture

According to the questionnaire responses, OC and OS are more like lubricants that enable a firm to create/innovate and implement its BM. Specifically, OC was the spirit determining how a firm manages itself (autonomy) and its information flows. Moreover, OC can incubate innovation to help a firm to create its business model and access the innovation performance. However, not all kinds of OC are positive to facilitate performance.

> *Everything shall have a positive and negative side. For example, when the boss said that we should all go in that direction. If it is right, it will be very efficient, but if this is not the right way, then everyone is wasting resources, so the key is to see if these inputs are symmetrical to recycling. In other words, we need to be able to examine the result of our output in a certain point and determine if we shall continue to do this or not (BU director or A1).*

In the above sharing, the participant highlighted the advantage and disadvantage of centralization culture. Moreover, the risk of resources wasted was also addressed as the result of the high management's inappropriate decision. However, communication was addressed by A3 as their solution to create their culture and help the organisation to work effectively.

> *Our organizational culture is simple. Because we started with U.S. technology, the CEO at the beginning was American. But the main shareholders and the management team are Taiwanese. So, our culture means that we have the west open culture, regardless of class, but we also have the spirit of working hard to accomplish tasks as Asia philosophy. But in fact, many other companies have conflicts in these two aspects. We are relatively fortunate that this situation did not last very long in our company. As long as the American CEO and the Taiwanese*

bosses reach their agreement. The employees directly follow the decision. So, the fusion is relatively fast and effective (COO of A3).

Other than the culture regarding the top management's decision and communication, how to create the environment for the employee is also mentioned as the driver of innovation performance.

Our culture is self-disciplined, innovative, and kind. For example, everyone in our company gets an average salary several times better than other companies. We always want to recruit experienced people in the industry. Because if employees make mistakes in the process, they increase our loading. So experienced people will not repeat or waste resources with self-discipline. They are all very kind. In addition, we are all in a large division of labor, and will not be very devised in function significantly (President of A8).

Instead of autonomy and communication, A3 and A12 share their experience shedding light of how culture can facilitate the innovation. In short, a company needs to create the culture to enable its employees to constantly believe that innovation is the elements working along with their daily life to create value.

Innovation is just the beginning of change. Once it appears, it is no longer an innovation. So how to transform this innovation into a part of the company, such as a corporate culture and the company's routine is the key to innovation success (BU director of A3).

Our culture is also very important. We are sharing the belief in making things better, communication all the time, how to find the way to do things better, and value sharing. And one of the values of our culture is to believe that our product could make a difference. So, we are not building this product merely for profit, but what kind of product can really contribute to the world. That priority has a higher position than making a profit to us (Founder of A12).

In Table 6.9, we list the characteristics of OC based on the interview respondents' ideas.

Table 6.9: OC definition elements.

	OC characteristic:	Existing company:	Start-up:
Autonomy	Self-discipline	A1. A3. A4. A5	A7. A8. A9. A10. A11. A12
	Flexible in rules	A1. A4	A7. A8. A9.

			A10. A11. A12
	Comprehensive and cross-functional Communication	A1. A2. A3. A4. A5. A6.	A7. A8. A9. A10. A11. A12
Information flow system	Centralised	A1. A2. A3. A4. A5	A7. A8. A9. A10
	Power-sharing	A2. A3. A4. A5	A10. A11. A12
	Transparency	A1. A2. A3. A4. A5	A7. A8. A9. A10. A11. A12
Innovation incubation:	Learning and development	A1. A2. A3. A4. A5	A7. A8. A9. A10. A11. A12
	Tolerance for conflict and risk	A1. A2. A3. A4. A5	A7. A8. A9. A10. A11. A12
	Risk-taking	A1. A2. A3. A4. A5	A7. A8. A9. A10. A11. A12

The above descriptions and the elements outline how the organisational cultures affect the deployment and employment of resources. Stated differently, organisational culture affects the formation and implementation of business model to facilitate a company's innovation performance.

6.5.2 Organisational structure

Comparatively, OS is the internal function of the firm which helps to embody innovation. Different kinds of OS characteristics will lead to different outcomes derived from the BM design or implementation.

> *In our company, the profit center system represents our main structure. For example, PC unit is an organization, and must undertake its own success or failure. The same, other BU must also be responsible for their own profits and losses. In order to decide to keep investing resources in or to reduce the investment of these business bodies, we must be very clear about the corresponding judgment standards to determine what to do next. Therefore, we have a flat structure to avoid any complicated and unnecessary communication. In short, innovation is still very important for us to move forward, so the flat organization is also important for us to communicate within the organization effectively to implement the BM for the developed innovation (BU director of A5).*

> *A correct organizational structure and functions are required to perform the so-called BM or other functions (COO of A3).*

> *The business model serves as the north star to lead us. The OS indicates how fast*

we could get there with SOP, better process, better knowledge, and better structure. (Founder of A12).

Based on the descriptions of A5, A3, and A12, organizational structure aims to serve a company's BM to be performed. However, certain functions are required for facilitating the innovation. For example:

…I think our flat organizational structure is about transparency and efficiency, the focus is to allow information to be circulated fluently. But the final decision maker should decide whether to listen or not (BU director of A5).

…our structure is very devised by function, which means we have different divisions specialized in different things. Our vertical structure will also help the internal communication and integration to get all the functions or information together for facilitating our innovation (consent manager of A6).

And for the structure, everything is on paper, and we record everything, all the note of the meeting to document the decision…So the organizational structure shall enable all the players to enjoy the process of creating things or invent stuff …and to bring the innovative idea into the structure to make it real (founder of A10).

As the given points indicated, in the pursuit of facilitating innovation, table 6.10 demonstrates the essential characteristic of OS.

Table 6.10: OS definition elements.

	OS characteristic:	Existing company:	Start-up:
Functional diversification:	Specialisation	A1. A2. A3. A4. A5	A7. A8. A9
	Functional differentiation	A1. A2. A3. A4. A5	A7. A8. A9
	Professionalisation	A1. A2. A3. A4. A5. A6.	A7. A8. A9. A10. A11. A12
Structure characteristic:	Centralisation	A1. A2. A3. A4. A5	A7. A8. A9
	Formalisation	A1. A2. A3. A4. A5	
	Vertical differentiation	A1. A3.A5	A7. A8. A9

These OS characteristics carry out the function of serving business model execution and the innovation within the organisation. Moreover, they are correspondingly

evolved to fit the BM innovation.

6.5.3 OC and OS elements

The disclosed characteristics of OC and OS derived from the interviewees' perspectives not only provide the points reading their purposes and functions, but the addressed ideas also enable the investigation to reach the corresponding elements from the literature. Thus, by adopting the essence of the suggested OC and OS characteristics, the investigator reaches the selected literature and list the items in Tables 6.11 and 6.12 associated with the academic sources.

Table 6.11: The organisational culture elements

	Scale:	**Source:**	**Number of items:**
1	Learning Organisational culture.	Gephart et al., (1997)	5
2	Leadership Risk-taking culture.	Kaiser (2000)	4
3	Leadership risk tolerance culture.	Gu (2014)	3

Table 6.12: The organisational structure elements

	Scale:	**Source:**	**Number of items:**
1	Specialisation structure.	Daugherty (2011)	3
2	Formalisation structure.	Damanpour (2011)	3
3	(De)centralization structure.	Damanpour (2011)	3

An exploration of these elements aimed to form the measurable items (predictable variables) to compose the organisation culture and structure (latent variables) for the following quantitative survey.

6.5.4 The interaction between OC, OS, and BM

Apart from the identification of OC and OS elements, the most striking observation to emerge from the data analysis is that OC and OS significantly affect the formation and exercise of the business model. Moreover, BM, OC and OS work with each other as part of a dynamic ecosystem to keep BM evolving and innovative. For example, a metaphor reflecting the interaction was provided by the BU director of A 5, who said:

They (OC, OS, and BM) are working with each other interdependently.

Organisational structure is like a human body structure or function. Organisational culture is our soul, our attitude, and our mind. Business model is like the method that helps us to get things done. Only if these three things can work in combination, then we (our company) can become a complete people. However, I think organisational culture is more important than the other two. We must first have the attitude to identify and build the essential elements in the structure before taking action. Eventually, it is all about making us (the company) from an ordinary person to a superman, and then we can create value (product/service) for the market (BU director of A5).

This metaphor implies how these three subjects interact with each other and adds more weight on the OC as the driver to initiate the running of the mechanism. Meanwhile, the technology head of A 4 prioritised the business model as the driver to inspire modifications to the organisational structure.

I think BM is the core thinking of how a company operates, how to make profit and how to develop. So, it has a direct impact. In other words, if BM's thinking changes, then the organizational culture and organizational structure will also be affected (Tech head of A4).

Moreover, A6 considered organisational culture and structure as working together to facilitate the innovation and performance of the business model:

…the organisational structure and culture are supposed to work together to help the business model's implementation, and the business model is more like the mediator directly affecting the access of innovation performance (Consent manager of A6).

Interestingly, numerous perspectives emerged from the interviews regarding how organisational culture and structure interact with business model, and Table 6.13 demonstrates the discrepancy of the interactive patterns.

Table 6.13 The interaction pattern of BM, OC and OS.

Relationship identification	Existing company	Start-up
(OC/OS)->BM->IP	A1. A2. A4. A5.	A7. A8. A9.
(OC->BM->OS)->IP	A3. A6	A10. A11. A12

Reflecting on the collected evidence from the respondents, OC and OS can be

considered to be the moderators affecting the development and execution of the business model (company 1.3.4.5.6.10.12). Foss and Saebi (2016) argued that organisational culture and organisational structure are assorted to the intermediate set of firm-level variables significantly intertwined with BMI to endogenously influence the change of structuring, coordination, work motivation, objective setting, and resource allocation. In short, the organisational culture and structure design imperatively determine the effect of BMI components' reconfiguration.

Nevertheless, even though the interviewees provided multiple perspectives to comment on how these three subjects (OC, OS, and BM) interact with each other, all the participants consider that organisational culture is the first thing to happen within the firm, which leads the business operation (A1.A2.A3.A4.A5.A6.A7.A8.A9.A10.A11.A12). When OC changes, the way a firm conducts its business model will also change. In the corporation, OS can help BM to be executed better. However, a good internal communication channel must be ready to smoothly allocate the resources (A1.A3.A5.A6). As for the start-ups, their OS is formed based on the OC and modified by the business opportunities (A7.A8.A9.A10.A11.A12). Simply put, the literature (as Chapter two addressed) and the collected data indicate that OC is the driver of the BM formation and the company management, and that OS is the environment to accommodate the BM implementation. Stated differently, the given data endorse the interaction showing that OC affects the BM formation and OS design, BM affects OS, and eventually BM impacts the innovation performance.

To sum up, this section demonstrates the way OC and OS interact with BM. OC plays the role of facilitating the innovation within the BM, and OS accommodates BM execution by adjusting to its modification accordingly. Moreover, based on the data analysis and literature source, the explored OC and OS elements (predicator variables) will contribute to the examination of OC, OS, and BM's relationship in the quantitative survey.

6.6 Innovation performance

In the forthcoming quantitative research, indicators of the innovation performance (IP) need to be unequivocal to enable the dependent variables measurable in the research model. The listed items were derived from the collected information regarding innovation success (the last section of the interview questionnaire). The diversity emerged in the given ideas of innovation performance among the respondents, by which numerous items were explored and adopted in this research.

Prior to commenting on the indications of innovation success, the respondents were asked to describe their concept of innovation. Numerous themes emerged from the given perspectives based on the interviewees' experiences. In general, all the ideas regarding innovation were relevant to one primary theme: detecting new market opportunities and taking new ways or actions to respond. For instance, A8 shared his idea by categorising innovation into radical and incremental innovations and considered that their applied innovation was the latter:

> *We make what customers want based on their needs. It is equivalent to using innovation to meet the needs of the market. Some new features have appeared to make things easy to use, for example, to make the systems connect to each other in as a new application (President of A8).*

His concern lay in engaging better with his customers. However, A7 had a different view of innovation by focusing on the brand-new product development. Its COO explained:

> *I think we found an interesting optical structure at the beginning, a method that no one has found in the past, so we used this method on a semiconductor element, which also confirmed that this method can achieve what we envisioned as a unique and better conduction. So, we use this approach to try to make products (COO of A7).*

By adopting the given perspectives from the interviews, the identification of innovation is demonstrated in the table below.

Table 6.14: Innovation identification

Themes	Innovation elements	Existing company	Start-up
Take new actions to	New ways to employ and deploy resources	A1. A5	A7. A8. A9. A10. A11. A12

respond to the market change.	Generate a new product/service that never happened before.	A1. A2. A3. A4. A5	A7. A8. A9. A10. A11. A12
	New position in the value and supply chain	A1. A3	
	new process with higher efficiency	A2. A3. A5	A7. A10. A11. A12
	Combine the knowledge from fields	A1. A2. A3. A5. A6	A7. A8. A10. A12
	Create/raise a new market	A1. A2. A3.	A7. A8. A10. A11. A12
	Improve the current product/Service	A3. A4. A5	A7. A8. A9. A10. A11. A12
	Better engage with the existing market	A3. A4. A5	A7. A8. A9. A12

Each of the above innovation elements is unique in terms of its source and the implication. However, by adopting the definition of radical and incremental technology innovation and business model innovation, the three types of innovation were identified as distinct approaches that enable a company to develop its competitive advantage (Christensen, 1997, Christensen, 2001, Markides and Geroski, 2004, Lanzolla and Markides, 2020).

Following the innovation identification, the interview questions moved on to examine the themes of identifying the success/performance of innovation. All the participants considered "make differentiation" to indicate innovation performance. Meanwhile, most of the respondents considered "making profits", and "sustainability" as being essential reflections of innovation success. For example, in terms of making profits, A5 gave an obvious indication to identify the performance of their applying innovation:

> *If we set each engineer to complete the (training program) certification for each season in a year, then, of course, I would see if the results presented by him each season are achieved. For example, their efficiency was 70% before, which became 80% after one season. Of course, these goals still need to make money in the end. The ultimate purpose of the company is to grow even bigger. So, to earn money and have funds to achieve this goal (BU director of A5).*

He also emphasised how they apply innovation to improve employee efficiency and eventually make profits. However, innovation also referred to the product's expected

performance, which led to financial return of the investment. According to A6:

> *We measure the innovation performance on to what extent the energy we can get in the percentage of the time. Such as for an individual turbine which can generate how much power? in what (transfer) efficiency%. So that is the innovative performance of products or technology. The financial performance is more like the MDP, IRR, which means when we could have our investment back and start making money (Consent manager of A6).*

Other than making profits, some participants focus on how their innovation (product/service) can disrupt the market such as current customer behaviour and habits. For instance, the founder of A12 said:

> *I guess we can measure it (innovation performance) by seeing how many percentages of our customers are actually using our product frequently. Then it will be really cool to see they might change the way they practice and train (table tennis). That will be a very cool behaviour change of learning the sport in a new way along with the modern technology. Now since this tutorial is all online, you are no longer restricted by geographic limitations (Founder of A12).*

Creating competitive advantages is also an indicator to measure innovation performance. Differently put, keep the companies' sustainability in the market**.**

> *To put it simply, this (technology) innovation can stimulate demand, that is, I can not only sell one product to the original customized customer. But because it is very easy to use, it can be commercialized to develop another market, and it can be sold enormously. Simply put it creates continuous sales, and I think this is the most significant principle for my judgment of the innovation success. (President of A8).*

Hence, by learning from the collected data, this investigation managed to make prominent the elements reflecting innovation performance, which are presented in Table 6.15.

Table 6.15: Innovation performance elements

Themes:	Innovation performance elements:	Existing company:	Start-up:
Making profits	improve the	A3. A4. A5	A8. A9

	performance of current product or service to engage better with the existing customers		
	make or gain more profits	A1. A2. A3.A4. A5. A6	A7. A8. A9. A10. A11. A12
	New source of profits	A1. A3	
Disrupt the market	make a huge change to raise or create a new market.	A1. A2. A4	A7. A8. A10. A11. A12
	Create a new market solution	A1. A2. A3	A7. A8. A9. A10. A11. A12
	Draw the market attention	A2. A3	A7. A8.A10. A11. A12
Sustainability:	Make long term impact	A1. A2. A3. A4. A5. A6	A8. A10. A11. A12
	Create sustainable competitive advantage	A1. A3	A7. A8. A9

Some 14 items of innovation performance reflect the qualitative research findings and the themes from academic sources Table 6.16

Table 6.16: Innovation performance items

	Innovation performance items:	**Sources:**
1	The sales revenue in the first 12 months after its launch.	(Bodial 2010, Atuahene-Gima and Ko, 2001, Wang 2009)
2	The market share in the first 12 months after its launch.	(Bodial 2004, Atuahene-Gima and Ko, 2001)
3	The return on investments the new product achieved in the first 12 months after its launch.	(Atuahene-Gima and Ko, 2001)
4	The actual quality of the new product.	(Salomo 2007)
5	How easy it is to manufacture the new product.	(Salomo 2007)
6	How innovative the new product is compared to what already exists in the market (“first in the market”)?	(Wu 2016)
7	How hard is it for our competitors to imitate our new product?	(Gok 2017)
8	How do customers respond to our new product?	(Zvi H. Aronson and Lynn, 2008)
9	How do intermediaries (e.g., distributors, agents) respond to our new product?	(Zvi H. Aronson and Lynn, 2008)

10	How well the new product fits with our existing products?	(Nguyen et al., 2019), (Forés and Camisón, 2016)
11	How well the new product complements our existing products?	(Nguyen et al., 2019), (Forés and Camisón, 2016)
12	How much the new product helps to boost market performance for our existing products?	(Nguyen et al., 2019), (Arnold et al., 2010)
13	How much the new product changes the existing consumers' habits and behaviours?	(Markides and Geroski, 2004, Christensen, 1997)
14	How much the new product undermines the existing infrastructure used to support the competitors' established success?	(Markides and Geroski, 2004, Christensen, 1997)

In addition to identifying the innovation types and the inherited indicators of innovation performance, the access of innovation performance is also part of our concern. Hence, along with the interview questionnaire flow, the participants elaborated on more details regarding how to access innovation performance. According to the A1, the impact of "resources securing" was emphasised as the approach to innovation performance. Its BU director said:

> *There are things that can not necessarily be done by ourselves, so we need a partner. But most of the time, it is not good enough because anyone can find the partner that we found, and it is convertible. That is why we will also go for mergers and acquisitions, and then these resources can be considered exclusive to us. If it is not urgent, you must buy other people's technology or set up a joint venture. Let others help to cover your shortcomings. There are always resources of technology and channels that cannot be built in the short term, such as the relationship with customers requiring years to establish, you have to buy those companies that already know customers or those teams (BU director of A1).*

Interestingly, A2 gave more clues as how to successfully deliver value and create innovation performance:

> *The sale of our developed innovation/solution is the significant approach to the innovation performance. For example, we must promote our product to the market, so I first went to the number one company in the field. If they can use our product, the followers will join and become our clients (COO of A2).*

In addition to value delivery, value creation and capture also emerged in the interviews.

As for a start-up technology company, A7's COO considered the creation of a commercialised and profitable product as key to transferring the developed innovation into performance. According to him:

> *From the company's perspective, of course, profit reflects if the product's application actually carries value to the customer. But in fact, if this concept can be studied by others or applied in other fields, the practice is another story and does not necessarily indicate the same value. So, for the value that we intended to bring to the market, of course, we have to promote the products and develop the ability to contact the company and customers (COO of A7).*

Furthermore, to keep competing in the market and access innovation performance, the capabilities to best utilise resources was key for capturing the value from the developed innovation:

> *We are not Apple (the company); we do not have strong marketing resources to boost sales. Since our main customers are the manufacturer factory, engaging with these customers and predicting the next market trend is significant for our further development. Meanwhile, the other concern is that we certainly hope that our technological know-how can constantly bring revenue. For example, our core competitiveness is R&D, so I do not want to spend resources on production to squeeze our profits. I just want to focus on observing market demand and developing a good product to fit that need. (President of A8).*

In short, a company needs to constantly develop new ways of value creation, delivery and capture underpinned by resources deployment and employment to keep itself in a leading position and access innovation performance. These elements are presented in Table 6.17.

Table 6.17: Innovation performance access items:

Innovation performance access elements	**Existing company:**	**Start-up:**
Secure executively with the needed resources	A1. A3. A5	
Reach the best efficiency in utilising resources	A2. A6	A7. A8. A9. A10. A11. A12
Keep providing a better and unique solution to the market.	A3. A5. A6	A7. A8. A9. A10. A11. A12
Build company's reputation	A3. A5. A6	A7. A8. A9. A10. A11. A12

Innovative way to deliver value	A3. A5. A6	A7. A8. A9. A10. A11. A12
Innovative way to capture value	A4. A5	A8.
Reaching internal consensus (better communication)	A5. A6	A8. A9.A10. A11

In general, some respondents emphasised the fact that the concept of innovation lies in generating a new-to-the-world product to facilitate or raise the emergence of new markets (A7.A8.A10.A11.A12). However, engaging better with existing markets or customers by improving the product or service was also addressed by other strategy makers during the interviews (A1.A3.A4.A5.A6). In other words, radical and incremental innovation indicates the two strategic choices that guide a company to build its competitive advantage.

Apart from product innovation, business model innovation (BMI) has been viewed as a form of innovation (Diacoun., 2014, Foss and Saebi, 2016, Baden-Fuller and Morgan, 2010), which is distinct but can work with product innovation to build a company's competitive advantage (Zott and Amit, 2012, Zott and Amit, 2007, Teece, 2010a, Chesbrough, 2007). However, the argument addressed among scholars and managers is: in what way BMI can enable and facilitate innovation to achieve performance from the developed innovation (Baden-Fuller and Morgan, 2010, Baden-Fuller and Haefliger, 2013)? Yet, by investigating the relationship between BM and technological innovation, a proposed view with clear and coherent manner is revealed in section 6.2 implying that BM design and innovation is the approach for technology innovation performance. Nevertheless, the interview participants hold different expectations on what their developed innovation can ultimately pay back their efforts. Hence, besides enhancing the role of BM towards innovation performance, the numerous items collected from the qualitative method enlighten the path of our pursuit of learning how BM impacts innovation performance.

In summary, a notable finding was the presence of two distinct technological choices (radical and incremental innovation) in the context where the business model operates. Meanwhile, the participants' responses gave us evidence that BM configuration and innovation played a role in accessing the innovation performance. Based on the data analysis, several definitions of innovation performance have emerged. The difference between these indicators implies that innovation performance can be identified as the projection of distinguished innovation choices. However, the access of the derived performances has not been unequivocal in terms of how BM configuration contributes to the value creation, delivery, and capture. Therefore, the explored items of innovation

performance specify the expectations of new product developers and the goals of the competent business models.

6.7 Improving the conceptual framework

The conceptual framework (Chapter Three) was developed based on the literature review to answer the main question of this thesis: how companies can apply business model to capture the value of their product innovations and enhance their competitive advantage. Given the importance of the research's validity and credibility, the phase one qualitative findings aim to contextualise the investigation by providing explanations and measurable variables. Along with this pursuit, we identify six points from the qualitative data analysis:

1. A company's newly developed product engaged in either radical or incremental innovation, referred to as its strategic decision.
2. Business model plays a role of the enabler of the product's innovation performance.
3. Business model needs to be constantly changed, and BM innovation aims to work with product innovation for a firm to create its sustainable competitive advantages.
4. Business model innovation emerges in the components' endogenous modification, the reconfiguration of the components and the entire change of the business focus to create BM heterogeneity.
5. The organisational culture has an impact on business model and organisational structure.
6. Business model has an impact on organisational structure.

The above findings provide crucial insight to complement the conceptual framework by explaining the relationship between the constructs (BM, OC, OS and IP) and adding the associated measurable variables of the research model.

In brief, a company's engagement of radical and incremental innovation determines its new product development direction and the corresponding business model to generate the expected outcome. Moreover, innovation emerged in the business model components, configuration and the business focus led to the companies' sustainable competitive advantages. These findings underpin the researcher's essential argument: *each business model (configuration) will facilitate varied types of innovation performance in its specific way of deployment and employment of capabilities, resources to perform activities*. To be specific, this research aims to disclose the compatibility of the business model components, business model configuration and the business focus under different contexts (innovation types and business environments) to present the discrepancy of multiple business models. Stated differently, the findings meant to answer "how" to make business model exert its intended performance in the

pursuit of capturing the value from a firm's developed innovation. The explored identifications, purposes, and indicators of BM, OC, OS, and IP make the research model rational and measurable.

The previous eight hypotheses proposed in Chapter Three are meant to examine the relationships between various business model factors, such as capabilities, resources, activities, organizational culture, organizational structure, and business model itself. These hypotheses laid the groundwork for understanding the intricate composition within business model and its impact on innovation performance.

However, the qualitative findings from the research extended the scope by introducing three additional Hypothesis 9, 10, and 11(table 6.18). These new hypotheses delve into previously unexplored dimensions, specifically focusing on the evolution of business model components and the influence of regional and product innovation factors. By incorporating these additional dimensions, the research framework is strengthened, offering a more comprehensive understanding of how the business model adapt and interact within diverse contexts.

The inclusion of hypothesis 9, hypothesis 10 and hypothesis 11 enriches the research by providing insights into the dynamic nature of the innovation performance business models and their evolving role in driving innovation performance across different regions. This expansion enhances the scholarly discourse in the field by offering a nuanced perspective on the complex interplay between business models and organisational dynamics. Overall, these additional hypotheses contribute to a deeper understanding of how managers can leverage their business models to achieve sustained competitive advantage in today's dynamic business environment.

In closing, the phase one qualitative research findings adequately contextualised the phase two quantitative survey by verifying the theoretical propositions with tested hypotheses (table 6.18) and developing the measurable model (Figure 6.1) with rationality and indicators. The following quantitative research will devote to identifying the discrepancy of business models in the context of radical and incremental innovation, and the survey will be conducted in the United Kingdom (U.K) and Taiwan (TW) to compare how OC and OS interact with business model in east and west business environmen

Figure 6.1: The research model

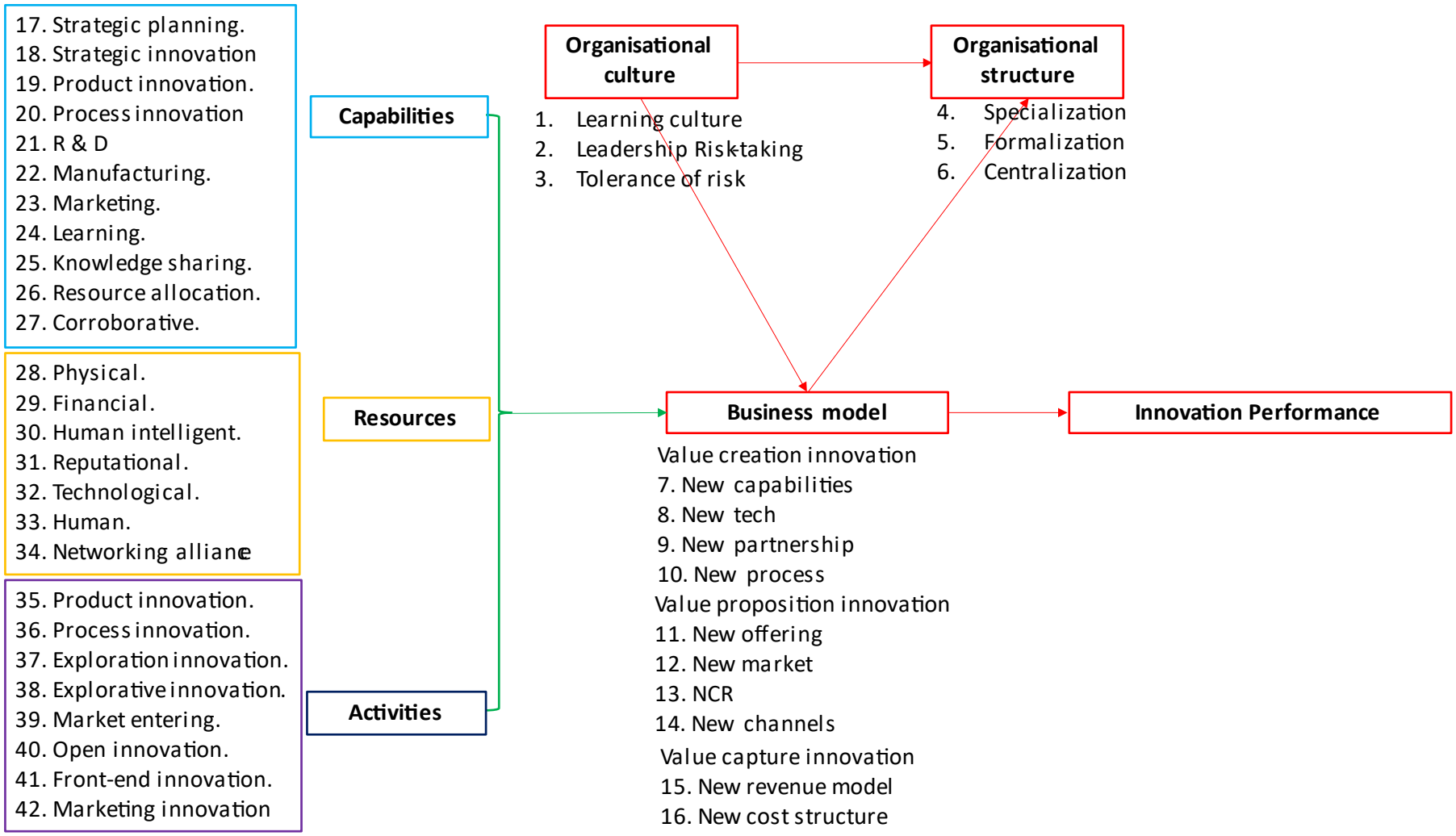


Table 6.18: Summary of the revised hypotheses to be tested

Hypothesis 1:	Capabilities will have a positive relationship with business model.
Hypothesis 2:	Resources will have a positive relationship with business model.
Hypothesis 3:	Activities will have a positive relationship with business model.
Hypothesis 4:	Business model will have a positive relationship with a company's innovation performance.
Hypothesis 5:	Organisational culture will have a positive relationship with a company's business model.
Hypothesis 6:	Business model will have a positive relationship with a company's organisational structure.
Hypothesis 7:	Organisational culture will have a positive relationship with a company's organisational structure.
Hypothesis 8:	Different business models have various architecture and components to generate multiple outcomes.
Hypothesis 9:	Business model components evolve in different pursuits of innovative product development
Hypothesis 10:	Business model components evolve when operating in different regions
Hypothesis 11:	The interaction of a business model, organisational culture and structure will be different when the business model operates in various regions.

Chapter Seven: Quantitative Interview Instrument and Data Collection

The previous chapter elaborated upon the formation of the research model derived from the qualitative data collection and analysis. The explored context and the corresponding variables complete the testing model by enhancing its rationality and adding measurable characteristics. To answer the theoretical hypotheses outlined in Chapter Three, this chapter will present the process of quantitative analysis.

This chapter seeks to outline three objectives: 1. the design of the quantitative research instrument, 2. the quantitative data collection procedure, and 3. an outline of how the quantitative questionnaire was designed, the data sources, how the samples were selected, and the difficulties that occurred during the investigation.

7.1 The quantitative research instruments

To consider the internal validity and reliability of quantitative data collection, a valid questionnaire is imperative to enable accurate data to be collected and a sufficient response rate to be achieved (Saunders et al., 2009). Hence, the questionnaire must make sense by giving the same meanings to the respondents as the researcher intended to present, and the given answers from the respondents will be comprehended by the researcher in the same way as well (Foddy, 1994). Therefore, a four-stage design method was adopted to develop the questionnaire (Saunders et al., 2009).

7.1.1 Stage one: Design the questions

Initially, a researcher needs to be clear about the required data to design the questions. The phase-one qualitative research stage provided the context and the 43 variables (171 items) for the phase -two quantitative research to test the research hypothesis. The questionnaire was divided into seven parts according to the themes and the research hypothesis corresponding to the testing model: 1. Introduction, 2. Innovation type, 3. Business model elements, 4. Organisational culture and structure, 5. Resources, capabilities, and activities, 6. Innovation performance, and 7. Demographic questions. Meanwhile, the question types include screening, categorizing, and Likert-style rating questions

The questionnaire introduced this investigation's purpose, the background, and the definition of a "new product" followed by the screening question "*During the past 18 months, has your company developed such a 'new product'"?* This question aimed to ensure that the engaged participant was qualified to provide the required data. Since the information of the "new product" is generally collected by rivals within 12 to 18 months after the decision is made to launch (Mansfield, 1985, Rijsdijk and van den Ende, 2011, West et al., 2020); the respondent's experiences of their "most recent innovative project" determined whether they were capable of sharing valid data to meet the research's objectives.

The first section of the questionnaire was meant to identify the participant's new product innovation type (radical or incremental). What first emphasised that none of the two innovation types were better or worse than the other. Then, the respondents were asked to answer question 1: *"Please reflect on your "Most recent new product" and choose by ticking the ONE column that best describes the innovation type and extent corresponding to your new product."* Four options were provided for the respondent(s) to choose from: Very radical, radical, incremental, very incremental.

Section 2 aimed to examine whether the organisational culture and structure affected business model innovation and implementation as they relate to innovation performance. Hence, question 2 was: "*From your own experience of the "new product", can you indicate how important each of the following activities were?"*

Section 3 was devoted to identifying how a business model facilitates innovation performance in the context of value creation, delivery, and capture. For example, question 3 first gave a short description of the challenge of creating innovation before asking the questions: "*To create innovation and develop new products is something that many companies find challenging. We have summarised how different companies try to meet these challenges. Please indicate how each of the following statements reflect on your company."* Question 4 focused on value creation, question 5 meant to elaborate on value delivery variables, and question 6 explored value capture.

In section 4, the researcher intended to explore the contained elements of the business model in terms of capabilities, resources, and activities. However, due to numerous items being needed to address the examination in this section, the list of items was divided into five parts. First split capabilities into strategic capabilities, technological capabilities, marketing and management capabilities (DeSarbo et al., 2005) before reaching resources and activities. The question was designed in a straightforward way to enable the participants to fully understand the question. Such as, in order to examine the variables of technology capabilities, the question asked: **"***Companies develop new products to take them up against their competitors. Different companies have different capabilities to help them achieve this goal. In the following list, we summarise some of such capabilities.*

Innovation performance items were addressed in the final section which was intended to elicit relevant discrepancies in the context of radical and incremental innovation. Hence, the implication of the genetic heterogeneity of innovation success was addressed before the rating question: "*When asked, different managers reported they use different criteria to assess the success of their efforts to develop and launch new products. The list below summarises these criteria. Please rate each of the following statements by using the 5-point scale (1= "Totally unimportant" to 5= "Totally Important").*

Lastly, the questionnaire gave the demographic question to collect information on the participants' backgrounds and working industries. The quantitative questionnaire is presented in Appendix C.

7.1.2 Stage two: Questions decoding

After developing the questionnaire framework and designing the questions to meet the research objectives, the next stage was to ensure that the respondents could decode the questions the researcher intended. Hence, all the main questions were presented with the context and the definitions ahead of time to ensure that the respondents understood the background and purpose. For example, in section 3, in order to examine what business model factors affect innovation performance, the rating question was addressed ahead as "In our efforts to create innovation and successful new product..." Moreover, since all items were adopted from the existing literature, the wordings of the items were adjusted or modified to be simple and clear. All these actions were meant to avoid any bias emerging from the respondents and help them decode the questions in the way that was intended.

7.1.3 Stage three: Respondents answer the questions

Due to the numerous items (171) that needed to be examined in the investigation, the questionnaire flow aimed to ease the respondents' resistance to completing all the questions. First of all, a 5-point Likert-type scale was adopted to increase the response rate and response quality, along with reducing respondents' "frustration level" (Babakus and Mangold, 1992). It was designed to be relatively simple for the interviewer to read out the complete list of scale descriptors (Dawes, 2008). In addition, considering that this questionnaire was conducted through online survey platforms, the questionnaire format and the paragraph distinction were adjusted to adapt to electronic devices (computer/mobile/pad). All the questions were presented well in the screen's original vision scope without further actions to enlarge the vision of the screen or a need to drag the screen to the right side to read the full sentence of the question and the rating scale. To prevent fatigue from repetitive actions, road signs were included throughout the questionnaire sections, indicating the percentage completed to encourage respondents to continue until the end of each question set. Additionally, each page was designed to focus on a specific topic to avoid any bias or argument that might confuse the respondent.

7.1.4 Sampling criteria

By following the sample screen criteria outlined in section 4.3, the research institutions were tasked with employing random sampling techniques to select respondents who meet specific sampling criteria. The samples are particularly targeting technology industry strategy makers from UK and TW companies. Samples are allocated proportionally to the

general population and randomized prior to survey deployment. While traditional-managed market research panels are preferred, social media platforms are also utilized for respondent recruitment. Online data collection institutions collaborate with certified sample partners to ensure validity, implementing IP address checks and digital fingerprinting technology to prevent duplication. Strategic panel partners employ deduplication technology to uphold survey data integrity. Niche panels are utilized for hard-to-research groups, incorporating hundreds of profiling attributes to ensure accurate respondent representation. The research institute is instructed to leverage multiple sample sources to best-fit research requirements, with third-party panels subject to quality control monitoring

7.1.5 Researcher decodes the respondents' answers

The answers were presented in numerical format based on the Likert-style scale, decoded, and then moved on to the statistical analysis to meet the research objectives.

7.1.6 Testing for reliability and validity

After the questionnaire was developed, the validity and reliability were tested by inviting academics and practitioners with a business background to conduct a pilot test. In the beginning, two English native speakers and two Chinese native speakers engaged in this pre-test and gave their feedback on the questionnaire draft. In general, the wording of the questions and items did not cause major issues in conducting this investigation. However, a few terms applied in the items did consume more time to comprehend the sentences before the testers gave their answers. Thus, the average time for completing the whole questionnaire was 30 to 35 minutes. An adjustment of the questionnaire was subsequently taken by adopting the advice from the pre-test participants, and the revised version consumed 25 to 30 minutes to complete.

7.2 Data collection procedure

The quantitative data for this study were collected from the participants' experiences regarding their most recent innovative project. The selected sample was consistent with the set criteria (Chapter 4) as the company's strategy decision-maker. This section aims to explain how the questionnaire was administrated to proceed the data collection after the research instrument had been designed, tested, and amended,

In order to administrate the questionnaire, access of the selected sample of participants was essential to conduct the data collection. As explained in Chapter 4, the estimated amount of data collection was from 200 to 220. However, there were drawbacks associated with the use of this questionnaire: 1. The access of a high-tech companies' decision-makers (in two regions) was limited , and the pandemic of (Covid-19) made it even harder since all the exhibitions or road shows were cancelled , 2. The motivation of the target participants to engage in this investigation was uncertain since the attempt to collect information was relevant to their company's strategy (sensitive information), 3. The resistance of the respondent to engage with or complete the full questionnaire occurred because of the questionnaire's length (30 minutes) which caused some level of fatigue. Therefore, the adopted strategy to conduct this quantitative research was to manage the survey online by using survey institutes to proceed with the data collection stage (Jackson et al., 2016).

In the UK investigation, Qualtrics was employed as the research institute to manage the online survey. After consulting four research institutes, there were only two companies capable of reaching the selected sample, and Qualtrics had been adopted in similar studies (Jackson et al., 2016, Muñoz-Pascual et al., 2019, Statsenko and Corral de Zubielqui, 2020, Ko et al., 2021). Meanwhile, an incentive money was offered to motivate the selected sample to finish the entire questionnaire. By the middle of March 2021, a pilot test was initiated by Qualtrics through its database to assess the validity of the developed questionnaire. After a soft launch of the questionnaire in their online panel, some pre-testers finished the questionnaire within 10 minutes, which was inconsistent with the previous sample test result of 25-30 minutes. In order to move the results from the "unthoughtful respondents" (those who answer question without giving a serious thought and complete the questionnaire in a very short period of time), we adjusted the speeding screener in the range from 50 to 60 minutes to exclude all "unthoughtful respondents" who completed the questionnaire in fifty minutes. In addition, before entering the main body of the questionnaire, potential participants were asked to fill in a questionnaire about their job title and working industries to verify that they met the selection criteria. After the

adjustment of the questionnaire, the official survey was launched on March 26th, 2021 by delivering the questionnaire through Qualtrics' full database, and 109 UK samples were collected before April 7th, 2021.

Even though the same strategy was adopted to collect the Taiwan data, due to the legal restrictions derived from the Taiwan Personal Data Information Protection Act（PDPA）, the time needed was longer than the UK investigation. China Credit Information Service, Ltd. (CRIF) was the only institute that answered the requirement of reaching the selected sample among the four TW research institutes. However, the regulation prevents CRIF to directly deliver the questionnaire via its database like Qualtrics did in the UK. Instead, the CRIF project manager needed to conduct the pre-work by talking to each potential participant in advance to explain the aims of the investigation, the process and the time needed to conduct the questionnaire, as well as the incentive to complete the full questionnaire. The questionnaire could only be sent to the potential participants through the given e-mail of the individual after acquiring permission from the potential participants. Therefore, although the Taiwan project also started in mid-March, the official data collection process did not begin until April 6th, 2021 and was completed on May 10th , 2021 with 119 valid samples returned.

The full data collection stage took place between March 2021 and May 2021 with 228 samples in total covering two regions (UK and TW). The data collection procedure was managed by two research institutes respecting to their located territory's regulation. The collected data was sent to the researcher in numerical format to be compatible with the statistical analysis software for the subsequent data analysis.

Chapter Eight: Quantitative Findings

The following chapter describes the statistical analysis of the collected quantitative data. The content of this chapter initially presents the aggregated data to depict the sample's characteristics. After the descriptive statistics are examined, the data assessment stage will proceed with the examination of the quality of the data. The following sections focus on verifying the research hypothesis by adopting the PLS-SEM statistical approach. The whole analysis is conducted through IBM SPSS 22 and SmartPLS 3.

8.1 Descriptive statistics of the sample

Descriptive statistics are meant to present information about the participants. The following section will demonstrate the regions where the respondents were working, the companies' industries, the innovation type percentage, the competitive advantage source, and the company size.

8.1.1 Demographic characteristics of respondents

To ensure the validity of this quantitative research stage and identify the appropriate candidates based on the sample criteria, the target respondents were categorised by their job positions, focusing on the companies' strategy makers in order to explore their adopted business model(s) and the corresponding components towards innovation performance. Top management (President, General manager and C-class executive) represented 53.4%, 10.5% were company owners, department heads (sales, marketing, R&D) constituted 31.1%, project managers 3.1%, and finally 1.3% were leading engineers.

Table 8.1: Job position of the respondents

Job position	Frequency	Present
President, General Manager, C-class executive	122	53.4
Company Owner/Entrepreneur	24	10.5
Department head (Marketing, Sales, R&D)	72	31.5
Project manager	7	3.1
Leading Engineer	3	1.3
Total	228	100.0

8.1.2 Company size.

The company size of the samples was identified by the number of the company's working employees. Out of 228 cases, 16.2% had 5~50 employees, 39% had 51~200 employees, 20.6% had 200~500 employees, and 24.1% had above 500 employees. Even though the company size did not necessarily affect innovation performance (Padilha, 2016), this information helped us to learn more about the background of the sample's construct.

Table 8.2: Company size

Employee number	Frequency	Percentage	Cumulative percentage
5~50	37	16.2	16.2
51~200	89	39.0	55.3

201~500	47	20.6	75.9
above 500	55	24.1	100.0
Total	228	100.0	

8.1.3 Sectors of the sample (High-tech industries)

In the high-tech companies, the data were collected and presented in the following table8.3. Among the respondents, 57.8% were from information technology consulting, computer hardware and software. Meanwhile, the semiconductors, automation, subassembly, and advanced materials industry represented 17.5% of the companies, and the telecommunications and renewable energy companies were 12.7%. The medical equipment, pharmaceuticals and biotechnology industries constituted 7.5% , and others were4.4%.

Table 8.3 Job position of the respondents,

Sector	Frequency	Percent
Telecommunications, Renewable energy	29	12.7
Information technology consulting, computer software and hardware.	132	57.8
Semiconductors, Automation, Subassembly, Advanced materials	40	17.5
Medical equipment, Pharmaceutical and biotechnology	17	7.5
Others	10	4.4
Total	228	100.0

8.1.4 Demographic characteristics of the innovation type and regions.

In this study, the data were collected from two regions (the United Kingdom and Taiwan). Out of the 228 respondents, 47.8% came from the United Kingdom, and 52.2% from Taiwan.

Table 8.4: Region of respondents

Region	N	Percentage
United Kingdom	109	47.8
Taiwan	119	52.2
Valid N	228	100.0

For the innovation type of the company, the following data were collected: very radical innovation was 11%, and radical innovation was 22.8%. Incremental innovation was 52.65%, , and very incremental was 13.6%. By identifying the innovation types of distribution in regions, in the United Kingdom samples, 16.5% were very radical, and 28.4 were radical. In terms of incremental innovation, the percentage was 40.4%, with 14.7% being very incremental. As for the cases from Taiwan, 5.9% were very radical, and 17.6 were radical. The majority lay in incremental with 63.9%. Very incremental was 12.6%.

Table 8.5: Innovation type of the company

Innovation type	N	Percentage
Very Radical	25	11.0
Radical	52	22.8
Incremental	120	52.6
Very Incremental	31	13.6
Total	228	100.0

In order to conduct the data analysis, radical and very radical innovations were all categorised as radical innovation, and the same logic was adopted to sort incremental and very incremental innovation. Hence, among all collected data, there were 49 radical innovation samples and 60 incremental innovation samples from the UK, and 28 radical innovation and 91 incremental innovation samples from Taiwan.

Table 8.6: Innovation type of the regions

Region		Radical innovation	Incremental innovation	Total
United Kingdom	N	49	60	109
	%	45.0%	55.0%	100.0%
Taiwan	N	28	91	119
	%	23.5%	76.5%	100.0%
Total	N	77	151	228
	%	33.8%	66.2%	100.0%

A Chi-square test was performed with the employment of the IBM SPSS 22 software to examine the independence of the two variables. The test presents the P value as 0,01, by which these two regions' business models relevant to the innovation type (radical and incremental) are independent of each other. This test result verifies our theoretical proposition that different business environments have contrasting business models. The descriptive statistic of individual items is presented in Appendix F, and the T-test report is presented in Appendix G.

Finally, because the number of items reached 171, the descriptions statistic of the items adopted the OLAP approach to calculate their mean and the standard deviation, which are presented in Appendix H.

8.2 Correlation analysis

To measure the relationship of the variables, a correlation analysis was conducted using IBM SPSS 22. The 43 variables were entered into the data column with a specific name. For example, learning organisational culture was shortened to LOC. This analysis aims to verify the relationship between two variables and to observe if the model is valid. After the analysis, most of the analysis results presented a P-value of less than 0.05 indicating significant association between variables. However, there was still insignificance demonstrated on a certain set of variables such as KSC (knowledge sharing) to FIR (financial resource), HIR (human intelligence), RER (reputational resource). The full table is presented in Appendix I.

8.3 Constructing the model

In order to examine the construct validity and create a measurable structure, exploratory factor analysis and principal component analysis (PCA) were applied. A PCA was performed by employing the SPSS software meant to understand the structure of a set of variables and reduce the dataset to a more manageable size. Identifying the clusters of variables was meant to explore the relevance of the factors and indicate the principle concepts that cannot be accessed directly (Field, 2018). This study used this statistical technique to verify the items in the sort of capabilities, resources, activities, business model elements, as well as the organisational culture, organisational structure, and innovation performance.

8.3.1 Capabilities

In terms of examining the variable of capabilities, there were 11 variables associated with 59 items. The conducted PCA first presents the commonalities of capability variables above 0.5 after the factor extraction. The results shown in Table 8.7 give us the confidence to apply the 11 observable variables (Field, 2018).

Table 8.7 Communalities of capabilities

	Initial	Extraction
SPC	1.000	.832
SIC	1.000	.868
PIC	1.000	.791
PRC	1.000	.854
RDC	1.000	.782
MAC	1.000	.785
MKC	1.000	.815
LEC	1.000	.865
KSC	1.000	.982
RAC	1.000	.689
COC	1.000	.725

Extraction Method: Principal Component Analysis.

Following the previous analysis, the KMO index was 0.942 as shown in Table 8.8. According to Field (2018), when the KMO index is above the recommended threshold of 0.5 it indicates that the data is factoring well. Meanwhile, the factor explains 64.181% of the variance (Table 8.9).

Table 8.8: KMO and Bartlett's Test of capabilities

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.942
Bartlett's Test of Sphericity	Approx. Chi-Square	1924.319
	df	55
	Sig	0.000

In the pursuit of reducing the number of observable variables to a manageable size and developing the latent variables for the measurement of the model, the further PCA analysis focused on the discrimination of the clusters of the variables. Table 8.9 presents the results of principal factor extraction in four clusters and the loading of the variables shown in Table 8.10 implies how the variables were sorted as the components of the specific cluster in order to explain the relations among a set of indicators. For example, strategical planning capabilities (SPE), strategic innovation capabilities (SIC), collaborative capabilities (COC) and resource allocation capabilities (RAC) were presented in component 1 as the results of the factor rotation to discriminate the factors by loading these variables maximally to only one factor (Field, 2018). Hence, by applying the results of the factor rotation and the implication of the variable's questions, the factors (four latent variables) were developed for further factor analysis.

Table 8.9: Total Variance Explained of capabilities

Component	Initial Eigenvalues			Extraction Sums of Squared loading			Cyclic Sums of Squared loading		
	Total	VAR %	Clative %	Total	VAR %	Clative %	Total	VAR %	Clative%
1	7.060	64.181	64.181	7.060	64.181	64.181	3.028	27.526	27.526
2	.899	8.177	72.358	.899	8.177	72.358	2.679	24.352	51.878
3	.527	4.790	77.148	.527	4.790	77.148	2.131	19.377	71.256
4	.500	4.546	81.695	.500	4.546	81.695	1.148	10.439	81.695
5	.437	3.976	85.671						
6	.379	3.446	89.117						
7	.339	3.084	92.201						
8	.296	2.690	94.892						
9	.232	2.106	96.998						
10	.175	1.588	98.586						
11	.156	1.414	100.000						

Extraction Method: Principal Component Analysis.

Table 8.10: Rotated factor Matrix of capabilities

Structure Matrix (Capabilities)				
	Factor			
	1	2	3	4
SPC	**.805**			
SIC	**.765**			
COC	**.641**			
RAC	**.589**			
PIC		**.750**		
MAC		**.727**		
PRC	.516	**.709**		
RDC		.586	**.528**	
LEC			**.808**	
MKC	.540		**.692**	
KSC				**.970**

Extraction Method: Principal Component Analysis.

Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

As presented in Table 8.11, four factors are developed with the discrimination of the content items. The conducted factor analysis gives the factor loading all above 0.5. The value of Cronbach's Alpha of strategy management, product development and marketing innovation capabilities are higher than 0.7 and indicate a good level of reliability of the acceptable consistency internal consistency (Hair et al., 2018). Since knowledge sharing (KSC) contained no factor but itself, it shows no Cronbach's Alpha value. Meanwhile, the total explained variance was 81.695%.

Table 8.11: Factor analysis of capabilities

Factor (Capabilities)	Factor content	Factor loading	Eigenvalue	Explained variation	Cronbach's a
Strategy management	SPC	0.80	3208.00	27.26	0.91
	SIC	0.77			
	COC	0.64			
	RAC	0.59			
Product development	PIC	0.75	2679.00	24352.00	0.87
	MAC	0.73			
	PRC	0.71			
Marketing	RDC	0.75	2131.00	19377.00	0.86
	LEC	0.73			

	MKC	0.71			
Knowledge Sharing	KSC	0.97	1148.00	10439.00	
Total explained variance: 81,695					

Factor (Capabilities)	Factor content	Factor loading	Eigenvalue	Explained variation	Cronbach's a
Strategy management	SPC	0.80	3208.00	27.26	0.91
	SIC	0.77			
	COC	0.64			
	RAC	0.59			
Produce development	PIC	0.75	2679.00	24352.00	0.87
	MAC	0.73			
	PRC	0.71			
Marketing	RDC	0.75	2131.00	19377.00	0.86
	LEC	0.73			
	MKC	0.71			
Knowledge Sharing	KSC	0.97	1148.00	10439.00	
Total explained variance: 81,695					

Extraction Method: Principal Component Analysis.

8.3.2 Resources

With regards to exploring the latent variables of resources, the same approach was applied as the PAC and factor analysis statistical technique used in the previous section. Seven variables and the associated 19 items were entered into the SPSS software. The results of communalities analysis of the seven resources variables were all above 0.5, indicating the acceptance of the variables' communalities (Table 8.12). In addition, Table 8.13 demonstrates that the KNO index is higher than the recommended threshold (0.5), indicating good data factoring to conduct further factor analysis.

Table 8.12 Communalities of resources

	Initial	Extraction
PHR	1.000	.916
FIR	1.000	.621
HIR	1.000	.702
RER	1.000	.599
TER	1.000	.738
HUR	1.000	.634

NAR	1.000	.577

Extraction Method: Principal Component Analysis.

Table 8.13: KMO and Bartlett's Test of capabilities

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.834
Bartlett's Test of Sphericity	Approx. Chi-Square	683.652
	df	21
	Sig	0.000

The results depicted in Table 8.14 show that two principal components are extracted from the resources variables, and Table 8.15 discriminates the resources variables into two clusters after the PCA analysis. Although human resources (HUR) variable has been categorised in both component groups and presented with similar loading, HUR is assorted to the tangible resources by considering its associated questions and the attribution of the developed latent variables (tangible and intangible resources) as shown in Table 8.16. In addition, the factor loading of the resource variables are all above 0.5, and the Cronbach's alpha of both intangible and tangible factors are higher than 0.7. The total explained variance is 68.405%.

Table 8.14: Total Variance Explained of resources

Component	Initial Eigenvalues			Extraction Sums of Squared loading			Cyclic Sums of Squared loading		
	Total	VAR %	Clative %	Total	VAR %	Clative %	Total	VAR %	Clative %
1	3.879	55.420	55.420	3.879	55.420	55.420	2.942	42.024	42.024
2	.909	12.985	68.405	.909	12.985	68.405	1.847	26.381	68.405
3	.649	9.271	77.676						
4	.520	7.433	85.109						
5	.435	6.219	91.328						
6	.337	4.821	96.149						
7	.270	3.851	100.000						

Extraction Method: Principal Component Analysis.

Table 8.15: Rotated factor Matrix of Resources

Structure Matrix (Resources)		
	Component	
	1	2

TER	**.842**	
HIR	**.827**	
RER	**.735**	
NAR	**.651**	
HUR	.595	**.529**
PHR		**.954**
FIR		**.630**

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.
b. Rotation converged in 3 iterations.

Table 8.16: Factor analysis of Resources

Factor (Resources)	Factor content	Factor loading	Eigenvalue	Explained variation	Cronbach's a
Intangible	TER	.842	2942	42.024	0.824
	HIR	.827			
	RER	.735			
	NAR	.651			
Tangible	HUR	.529	1847	26,381	0.749
	PHR	.954			
	FIR	.630			
Total explained variance: 68.405					

8.3.3 Activities

After analysing the capabilities and resources factors, the subsequent analysis was carried out to identify the latent variables of activities. By following the same procedure described in the previous sections, eight activities variables (PIA, PRA, EIA, EXA, MEA, OIIA, FEA, and MIA) were analysed by employing the SPSS program.

Table 8.17 presents the results of the factor extraction analysis as the communalities of activities were all above 0.5. The KMO value was 0.914 indicating that the factors were good for factor analysis.

Table 8.17 Communalities of Activities

	Initial	Extraction
PIA	1.000	.646
PRA	1.000	.765
EIA	1.000	.884

EXA	1.000	.762
MEA	1.000	.832
OIA	1.000	.953
FEA	1.000	.737
MIA	1.000	.732

Extraction Method: Principal Component Analysis.

Table 8.18: KMO and Bartlett's Test of Activities

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.914
Bartlett's Test of Sphericity	Approx. Chi-Square	1093.272
	df	28
	Sig	0.000

As shown in Table 8.19 and Table 8.20, the components are sorted in three principal components sections based on the loading and how they present in the same category. Building on the previous analysis results, the structure of the activities matrix was formed by studying the cluster of the variables and their contained questions and by developing the latent variables as marketing innovation activities, product innovation activities, and open innovation activities (Table 8.21). The factors loading are all above 0.5. The Cronbach's alpha value of the previous two factors is higher than 0.7. However, since the Cronbach's alpha value is meant to examine the content factors' relevance, it is understandable that none of these values was demonstrated on open innovation (OIA) because it was an isolating factor. The total explained variance is 78.889%.

Table 8.19: Total Variance Explained of Activities

Component	Initial Eigenvalues			Extraction Sums of Squared loading			Cyclic Sums of Squared loading		
	Total	VAR%	Clative%	Total	VAR%	Clative%	Total	VAR%	Clative%
1	5.046	63.073	63.073	5.046	63.073	63.073	2.896	36.204	36.204
2	.649	8.118	71.191	.649	8.118	71.191	2.124	26.548	62.752
3	.616	7.698	78.889	.616	7.698	78.889	1.291	16.138	78.889
4	.509	6.362	85.252						
5	.350	4.373	89.624						
6	.309	3.865	93.489						
7	.276	3.446	96.935						
8	.245	3.065	100.000						

Extraction Method: Principal Component Analysis.

Table 8.20 Rotated factor Matrix of Activities

Structure Matrix (Activities)			
	Components		
	1	2	3
MEA	**.870**		
FEA	**.761**		
EXA	**.647**	.583	
MIA	**.628**		
PIA	.597	**.508**	
EIA		**.874**	
PRA	.541	**.669**	
OIA			**.903**

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.
Rotation converged in 7 iterations.

Table 8.21: Factor analysis of Activities

Factor (Activities)	Factor content	Factor loading	Eigenvalue	Explained variation	Cronbach's a
Marketing innovation	MEA	.870	2896	36204	0.881
	FEA	.761			
	EXA	.647			
	MIA	.628			
Product innovation	PIA	.508	2124	26548	0.819
	EIA	.874			
	PRA	.669			
Open innovation	OIA	.903	1291	16138	
Total explained variance: 78.889					

8.3.4 Business model

After identifying the subject of business model components (capabilities, activities and resources), this section will focus on analysing the business model construct with the same statistical approach. First, the commonalities of business model are all above 0.5 as presented in Table 8.22. The KMO value of 0.931 referred to all good factors to proceed with the further PVA and factor analysis.

Table 8.22: Communalities of Business model

	Initial	Extraction
CAP	1.000	.659
TEC	1.000	.706
PAR	1.000	.619
PRO	1.000	.608
OFF	1.000	.839
MAR	1.000	.668
NCR	1.000	.724
CHA	1.000	.741
REV	1.000	.697
COS	1.000	.787

Extraction Method: Principal Component Analysis.

Table 8.23: KMO and Bartlett's Test of Business model

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.931
Bartlett's Test of Sphericity	Approx. Chi-Square	1147.500
	df	45
	Sig	0.000

The variance of business model factors was extracted to three principal components as demonstrated in Table 8.24, which subsequently underpinned the structure matrix in Table 8.25 corresponding with the cluster of the bundle components.

Table 8.24: Total Variance Explained of Business model

Component	Initial Eigenvalues			Extraction Sums of Squared loading			Cyclic Sums of Squared loading		
	Total	VAR%	Clative%	Total	VAR%	Clative%	Total	VAR%	Clative%
1	5.565	55.653	55.653	5.565	55.653	55.653	2.864	28.641	28.641
2	.833	8.329	63.982	.833	8.329	63.982	2.254	22.535	51.177
3	.650	6.497	70.479	.650	6.497	70.479	1.930	19.302	70.479
4	.568	5.683	76.162						
5	.521	5.205	81.367						
6	.494	4.942	86.309						
7	.409	4.095	90.403						
8	.358	3.576	93.979						
9	.326	3.257	97.237						
10	.276	2.763	100.000						

Extraction Method: Principal Component Analysis.

Table 8.25: Rotated factor Matrix of Business model

	Component		
	1	2	3
CHA	**.806**		
REV	**.771**		
PAR	**.699**		
PRO	**.534**		
MAR	**.533**		.509
COS		**.840**	
NCR		**.704**	
TEC		**.596**	
OFF			**.891**
CAP			**.532**

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.
Rotation converged in 5 iterations.

As mentioned previously, based on the results of Table 8.25 and the review of the corresponding question of each variable, Table 8.26 presents the three business model factors (latent variables) as new market BM, existing market BM and new product BM. Their contained factors loading are all above 0.5, and the first two factors' Cronbach's alpha values are all higher than 0.7. Even though the new product's Cronbach's alpha value is 0.643, it still gives an acceptable level of reliability. Meanwhile, the total explained variance is 70.479%. A reminder here is that these three business model factors indicate the type of business model. In other words, each type of business model will be employed to identify its components and impact on innovation performance.

Table 8.26: Factor analysis of Business model

Factor (BM)	Factor content	Factor loading	Eigenvalue	Explained variation	Cronbach's a
New market	CHA	.806	2864	28641	0.852
	REV	.771			
	PAR	.699			
	PRO	.534			
	MAR	.533			
Cost restructure	COS	.840	2254	22535	0.803
	NCR	.704			
	TEC	.596			
New product	OFF	.891	1230	19302	0.643
	CAP	.532			

Total explained variance: 70.479

8.3.5 Organisational culture

In a similar way, a PCA was conducted for constructing organisational culture. This analysis aims to verify the adaptability of the following factors: 1. Learning culture (LOC), 2. Leadership Risk taking (LRT), and 3. Tolerance of risk (TOR) to measure the organisational culture (latent variable). The factor extraction was conducted and resulted in presenting the communalities value of the three components above the threshold of 0.5 (Table 8.27). Meanwhile, Table 8.28 implies that the factors are acceptable for the factor analysis since the KMO value is 0.914 (above 0.5), while in Table 8.29 the organisational culture variance is 72.540%. Table 8.30 demonstrates the factor loading of each item and indicates their adaptability to measure organisational culture.

Table 8.27 Communalities of Organisational Culture

	Initial	Extraction
LOC	1.000	.719
LRT	1.000	.697
TOR	1.000	.760

Extraction Method: Principal Component Analysis.

Table 8.28: KMO and Bartlett's Test of Organisational Culture

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.701
Bartlett's Test of Sphericity	Approx. Chi-Square	227.008
	df	3
	Sig	0.000

Extraction Method: Principal Component Analysis.

Table 8.29: Total Variance Explained of Organisational Culture

Component	Initial Eigenvalues			Extraction Sums of Squared loading		
	Total	VAR%	Clative%	Total	VAR%	Clative%
1	2.176	72.540	72.540	2.176	72.540	72.540
2	.457	15.238	87.778			
3	.367	12.222	100.000			

Table 8.30: Rotated factor Matrix of Organisational Culture

	Component

	1
TOR	.872
LOC	.848
LRT	.835

Extraction Method: Principal Component Analysis.

8.3.6 Organisational structure

As for organisational structure, the statistical approach is conducted in the same way. Three items (SPE. FPR, and DEC) were employed in the PCA and factor analysis process to verify their indication toward organisational structure. Table 8.13 shows that the commonalities value of the SPE, FPR and DEC are all higher than 0.5. The KMO value presented in Table 8.32 is 0.642 (above 0.5). Meanwhile, Table 8.33 implies that the quality of the factors is acceptable for further analysis since the organisational culture variance is 61.420%. Hence, the factor loading of these three items gives the adaptability of the latent variable (organisational structure). In other words, SPE, FPR and DEC will be employed as the indicator of organisation structure.

Table 8.31: Communalities of Organisational Structure

	Initial	Extraction
SPE	1.000	.695
FOR	1.000	.625
DEC	1.000	.523

Table 8.32: KMO and Bartlett's Test of Organisational Structure

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.642
Bartlett's Test of Sphericity	Approx. Chi-Square	115.628
	df	3
	Sig	0.000

Table 8.33: Total Variance Explained of Organisational Culture

Component	Initial Eigenvalues			Extraction Sums of Squared loading		
	Total	VAR%	Clative%	Total	VAR%	Clative%
1	1.843	61.420	61.420	1.843	61.420	61.420
2	.679	22.647	84.067			
3	.478	15.933	100.000			

Extraction Method: Principal Component Analysis.

Table 8.34: Rotated factor Matrix of Organisational Culture

	Component
	1
SPE	.833
FOR	.790
DEC	.723

Extraction Method: Principal Component Analysis.

8.3.7 Innovation performance

The last part of this section analysed the innovation performance factors to develop the latent variables to complete the formation of the measurable model. Unlike the previous PVA which employed the variables (SPC, SIC) as the indicators to reflect the latent variables, the adopted items in the innovation performance measurement were the questions. The same statistical procedure was adopted to discriminate the factors for the model measuring. First, Table 8.35 presents the items as the 14 questions with their commonalities after the extraction, and item eight was 0.399. If the communalities value of items is below 0.4, the reliability is low and should not be accepted for further analysis. Thus, item eight was eliminated in this PCA and factor analysis. After item eight was excluded, the KMO value was 0.872, which shows good condition for the factors (Table 8.36).

Table 8.35: Communalities of Innovation performance

	Initial	Extraction
INP_1 The sales revenue in the first 12 months after its launch.	1.000	.740
INP_2 The market share in the first 12 months after its launch.	1.000	.721
INP_3 The return on investments the new product achieved in the first 12 months after its launch.	1.000	.681
INP_4 The actual quality of the new product.	1.000	.484
INP_5 How easy it is to manufacture the new product?	1.000	.591
INP_6 How innovative the new product is compared to what already exists in the market	1.000	.479
INP_7 How hard it is for our competitors to imitate our new product?	1.000	.551

INP_8 How do customers respond to our new product?	1.000	**.399**
INP_9 How do intermediaries (e.g., distributors, agents) respond to our new product?	1.000	.423
INP_10 How well the new product fits with our existing products?	1.000	.646
INP_11 How well the new product complements our existing products?	1.000	.573
INP_12 How much the new product helps to boost market performance for our existing products?	1.000	.609
INP_13 How much the new product changes the existing consumers?	1.000	.632
INP_14 How much the new product undermines the existing infrastructure used to support the competitors?	1.000	.581

Table 8.36: KMO and Bartlett's Test of Innovation performance

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.872
Bartlett's Test of Sphericity	Approx. Chi-Square	1160.398
	df	78
	Sig	0.000

Table 8.37 shows that the 13 items were discriminated into three clusters after the PCA. In addition, Table 8.38 gives the loading of each item and the cluster except item nine. Hence, this item was eliminated for the subsequent factor analysis. By looking at each indicator's item (question), three latent variables were formed: product feature innovation performance, product-market innovation performance, and product sales innovation performance. The Cronbach's alpha values of these three latent variables are all above 0.7, and the total explained variance is 57.926%.

Table 8.37: Total Variance Explained of Innovation performance

Component	Initial Eigenvalues			Extraction Sums of Squared loading			Cyclic Sums of Squared loading		
	Total	VAR%	Clative %	Total	VAR%	Clative %	Total	VAR %	Clative %
1	5.153	39.635	39.635	5.153	39.635	39.635	2.953	22.718	22.718
2	1.465	11.265	50.900	1.465	11.265	50.900	2.554	19.650	42.368
3	1.157	8.896	59.797	1.157	8.896	59.797	2.266	17.429	59.797

4	.794	6.107	65.903						
5	.725	5.580	71.483						
6	.627	4.822	76.306						
7	.615	4.727	81.033						
8	.532	4.095	85.128						
9	.471	3.619	88.747						
10	.427	3.283	92.030						
11	.388	2.987	95.017						
12	.345	2.655	97.672						
13	.303	2.328	100.000						

Extraction Method: Principal Component Analysis.

Table 8.38 Rotated factor Matrix of Innovation performance

	Component		
	1	2	3
INP_10 How well the new product fits with our existing products?	**.788**		
INP_5 How easy it is to manufacture the new product?	**.718**		
INP_11 How well the new product complements our existing products?	**.715**		
INP_12 How much the new product helps to boost market performance for our existing products?	**.694**		
INP_4 The actual quality of the new product.	**.575**		
INP_13 How much the new product changes the existing consumers? (habits and behaviours)		**.777**	
INP_14 How much the new product undermines the existing infrastructure used to support the competitors' established success?		**.747**	

INP_7 How hard it is for our competitors to imitate our new product?		**.709**	
INP_6 How innovative the new product is compared to what already exists in the market ("first in the market")		**.573**	
INP_9 How do intermediaries (e.g., distributors, agents) respond to our new product?			
INP_1 The sales revenue in the first 12 months after its launch.			**.841**
INP_3 The return on investments the new product achieved in the first 12 months after its launch.			**.784**
INP_2 The market share in the first 12 months after its launch.			**.783**

Extraction Method: Principal Component Analysis.

Rotation Method: Promax with Kaiser Normalization.

Rotation converged in 5 iterations.

Table 8.39: Factor analysis of Innovation performance

Factor (IP)	Factor content	Factor loading	Eigenvalue	Explained variation	Cronbach's a
Product feature	INP_10 How well the new product fits with our existing products?	.788	2.953	22.718	0.803
	INP_5 How easy it is to manufacture a new product?	.718			
	INP_11 How well the new product complements our existing products?	.715			
	INP_12 How much the new product helps to boost market performance for our existing products?	.694			
	INP_4 The actual quality of the new product.	.575			
Product market	INP_13 How much the new product changes the existing consumers' habits and behaviours?	.777	2.554	19.65	0.759

	INP_14 How much the new product undermines the existing infrastructure used to support the competitors' established success?	.747			
	INP_7 How hard it is for our competitors to imitate our new product?	.709			
	INP_6 How innovative the new product is compared to what already exists in the market (ex: first in the market)	.573			
Product sales	INP_1 The sales revenue in the first 12 months after its launch.	.841	2.266	17.429	0.803
	INP_2 The market share in the first 12 months after its launch.	.784			
	INP_3 The return on investments the new product achieved in the first 12 months after its launch.	.783			
Total explained variance: 57.926					

In general, the reliability of the factors is acceptable for further measurement by removing the lower value items. After the PCA and factor analysis, the variables were reduced from 43 to 21 in order to proceed with the statistical analysis. Nevertheless, the three business model latent variables refer to three different types of business model themes. In other words, the following statistical approach will adopt these three business model types as the vital construct to examine its relationship to the business model components (capabilities, resources, and activities), organisational culture, organisational structure, and innovation performance.

8.4 The adoption of PLS-SEM

After the variables had been vitrified and reduced to transfer the research model into a measurable one, Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed as the statistical approach to answer the research hypothesis based on the theoretical propositions.

Structural Equation Modelling (SEM) is a multivariate analysis method that can be employed to theoretically test supported linear and additive causal models by examining the relationship between a series of constructs (latent variables) (Wong, 2019, Sarstedt et al., 2014). Out of the two statistical methods in structural equation modeling (SEM), Covariance-based SEM (CBSEM) is the most commonly used to confirm or reject theories by examining the differences between estimated values and sample covariances, thereby testing hypotheses.(Hakala and KohtamÄKi, 2010). CBSEM models are remarkably adaptable when dealing with large sample sizes, normally distributed data, and accurately specified models, allowing for the conversion of theoretical concepts into practical SEM models(Wang et al., 2019). Comparatively, when the research aims to explore the fact by examining the causal relationship between variables, PLS-SEM can be the method to meet this kind of challenge with limited participants and skewed data distribution (Sarstedt et al., 2014, Hair et al., 2011, Wong, 2019). Hence, by considering the research aims, the research propositions, the collected data size and the strength of PLS-SEM, this statistic approach was adopted to estimate the cause-effect relationship model by conducting the analysis in the SmartPLS 3 software.

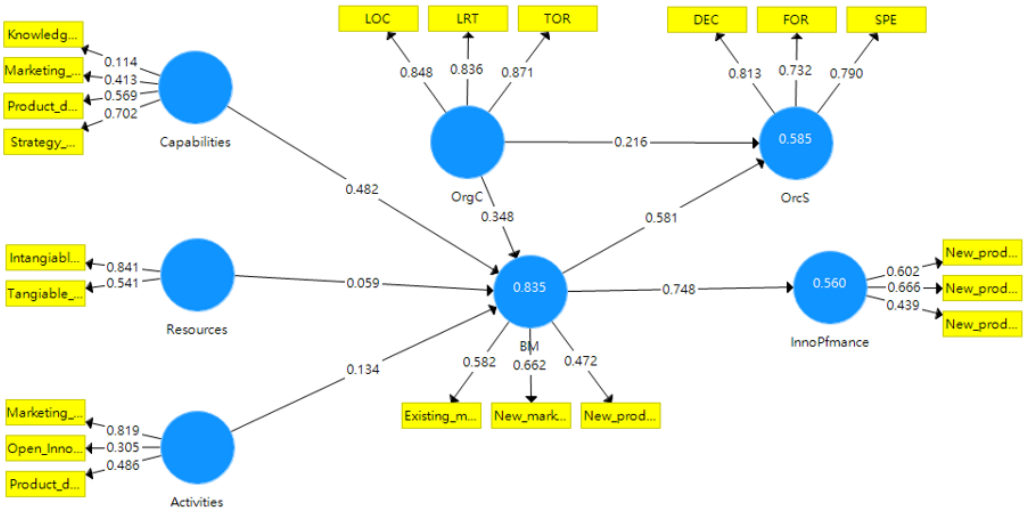
The PLS-SEM model was constructed by combining the measurement (outer) model and structural (inner) model. The measurement model indicates how the observable variable reflects the character of the latent variables. In contrast, the structural model represents the concept of the proposed theory that the latent variables (oval ones) are to examine the hypothesised cause-effect relationship. In the previous chapter, the observable and latent variables had been developed and examined as the verified factors. Thus, these variables were adopted in the PLS-SEM approach to form the SEM model. As mentioned, the three developed business models represent the three distinct critical constructs, therefore, the following PLS-SEM will adopt the Newmarket penetration (NMP) BM, Cost reduction (CR) BM and New product development (NPD) to examine the relationship between these three business models to other latent variables.

8.5 The development of the PLS-SEM model

As explained, this research aims to explore how the discrepancies of business models facilitate innovation performance. Stated differently, the PLS-SEM approach aims to identify the difference between business model configuration and the generated innovation outcome. The previous sections have depicted the observable variables and the indicated latent variables. However, by adopting the three explored business model types (NMPBM, CRBM and NPDBM) corresponding to the context of two innovation types (radical and incremental) and two regions (UK and TW), each business model type will have five different PLS-SEM models with its own distinct topic. For example, in terms of the NMP business model type, the statistic approach will select the relevant data to generate the results by showing the correlation of the latent variables in the pursuit of: 1) NMP (Whole data), 2) NMP (radical innovation), 3) NMP (incremental innovation), 4) NMP (U.K) and NMP (TW). In other words, the entire PLS-SEM analysis will generate 15 different models to conduct the comparison analysis.

Figure 8.1 presents the construction of the PLS-SEM model and the results after running the PLS algorithm with the whole data. As the model shows, there are seven latent variables: 1. Capabilities, 2. Resources, 3. Activities, 4. BM (business model), 5. OrgC (organisational culture), 6. OrgS (organisational structure), and 7. InnoPfmance (Innovation performance). Each latent variable is made up of observed indicators in the outer model as the reflective measurement scale. Meanwhile, the relationship between the latent variables is examined in the inner model as verification of the theoretical propositions. Specifically, in the PLS-SEM model, there are three structural models to test the research hypothesis. The left structural model focuses on examining the relationship between business components (capabilities, resources, and activities) and the business model(s). The middle one shows the intention to verify how organisational culture and structure interact with the business model(s), and the right one indicates the relationship between the business model(s) and the innovation performance. After running the PLS algorithm, the coefficients, outer loading, and R square value are demonstrated to explain the impact from one latent variable to the other and to what extent the dependent variable is explained by the independent variables. In addition, the subsequent analysis adopted the bootstrapping method (subsamples: 5000, significance: level 0.05) and generated the path coefficient of the inner model. The following data analysis was carried out by employing this model structure with varying data corresponding to the distinctive themes (business model types, innovation types, and regions)

Figure 8.1: The model after PLS algorithm (whole data)



A two-phase examination was needed for further analysis after the PLS-SEM model was established. The first phase focused on evaluating the measurement (outer) model by generating the construct reliability, convergent validity, and discriminative validity. Then , the examination of the research hypothesis was implemented in phase two by verifying the correlation of the constructs (Anderson and Gerbing, 1988, Williams and Hazer, 1986). The assessment of the outer model regards the examination of the individual items' (indicator reliability), reliability of each latent variables, internal consistency (Cronbach's alpha and composite reliability), construct validity (loading and cross-loading), convergent validity (average variance extracted, (AVE)) and discriminant validity (Fornell-Larcker criterion, cross-loading, HTMT criterion) (Ab Hamid et al., 2017). Table 8.40 integrates the needed figure to indicate the level of satisfactory validity and reliability. In terms of the indicator reliability, when its outer loading is lower than 0.4, it should be removed from the construct (Hulland, 1999, Hair et al., 2011). Hence, the knowledge sharing capabilities and marketing capabilities have been eliminated from the capabilities construct indicator clusters before further analysis proceeded. However, Hulland (1999) considered that, as long as the outer-loading is above 0.5, it is acceptable. Meanwhile, for those with loading between 0.4 to 0.5, a loading relevance test was performed to see if removing the unacceptable indicators will increase the AVE and CR of their respective latent construct. It turned out that new product sales performance would result in an increase of AVE and CR value of the innovation performance construct, hence it was removed from the PLS model. The revised measurement model table is presented in Table 8.41.

Table 8.40: Measurement model parameter estimation table (whole data)

Construct	Type	Indicators	Outer loading	Cronbach's a	CR value	AVE value
Capabilities	Reflective	Knowledge	0.176	0.000	0.552	0.250

		sharing capabilities				
		Marketing capabilities	0.363			
		Product development capabilities	0.455			
		Strategy management capabilities	0.755			
Resources	Reflective	Intangible resources	0.792	0.000	0.663	0.500
		Tangible resources	0.611			
Activities	Reflective	Marketing activities	0.821	0.000	0.568	0.333
		Open innovation activities	0.346			
		Product development activities	0.455			
Business model	Reflective	CHA	0.813	0.852	0.894	0.628
		MAR	0.809			
		PAR	0.777			
		PRO	0.790			
		REV	0.775			
Innovation performance	Reflective	New product feature performance	0.571	0.000	0.596	0.333
		New product market performance	0.665			
		New product sales performance	0.481			
Organisational culture	Reflective	LOC	0.848	0.811	0.888	0.725
		LRT	0.834			
		TOR	0.873			
Organisational structure	Reflective	DEC	0.811	0.684	0.822	0.607
		FOR	0.733			
		SPE	0.791			

After removing the unsatisfactory indicators, the PLS algorithm was re-run with the remaining indicators to form the revised SEM model for conducting the assessment of the model as presented in Figure 8.2. The values shown in Table 8.42 demonstrates the

acceptance of the outer model indicators after the loading relevance test (Wong, 2019). The CR (composite reliability) value was used to examine internal consistency, and the shown figures are all above 0.4 giving acceptance of the indicators. The AVE figures are all above 0.5 except for innovation performance. However, the noticeable point is that the AVE value increases after removing the low out loading variables. Despite the Cronbach's Alpha value showing zero in some constructs (capabilities, resources, activities, BM, innovation performance), these constructs proceeded with the PCA and factor analysis to transfer the original observable variables into items to form the latent variables. According to Svensson and Woodford (2003), when the adopted variables in the statistical analysis are not the measured items, but the second implication which means to construct the index, these are the casual variables. When the casual variables are involved in the statistical analysis, the Cronbach's alpha examination will be generally unsuitable. Hence, the internal constancy of the outer model might not be well presented by the Cronbach's alpha value for the construct of capabilities, resources, activities, and innovation performance. Moreover, Table 8.42 shows the crossing-loading indicators which means to examine the discriminant validity. The factor loading indicators on the addressed construct are supposed to be higher than all loading of other constructs.

Figure 8.2: The revised PLS model after algorithm (whole data)

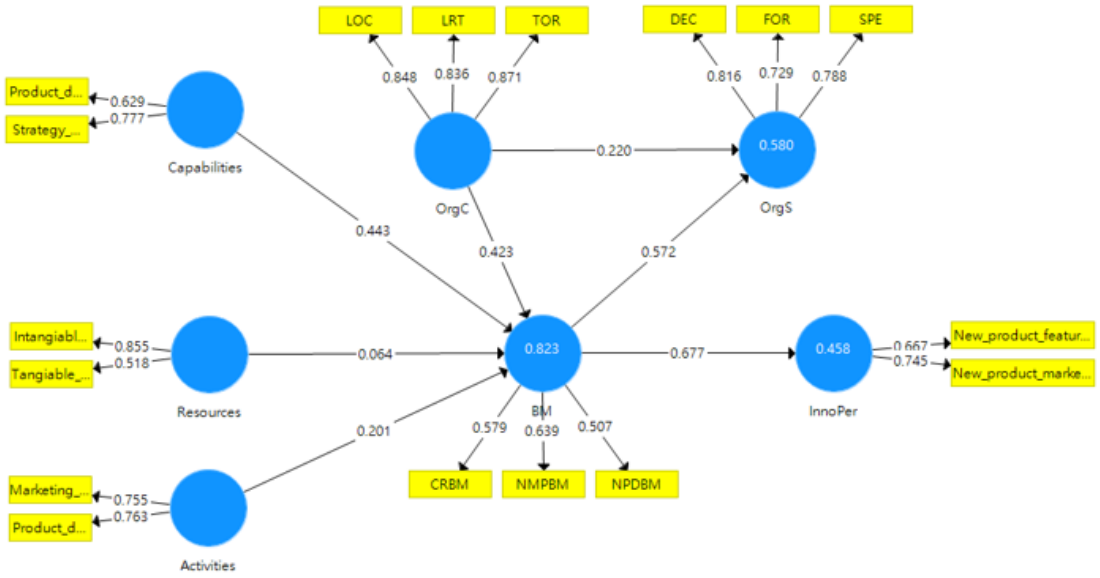


Table 8.41: Measurement model parameter estimation table (whole data B)

Construct	Type	Indicators	Outer loading	Cronbach's a	CR value	AVE value
Capabilities	Reflective	Product development capabilities	0.630	0.000	0.664	0.500

		Strategy management capabilities	0.776			
Resources	Reflective	Intangible resources	0.845	0.000	0.656	0.500
		Tangible resources	0.535			
Activities	Reflective	Marketing activities	0.860	0.000	0.653	0.500
		Product development activities	0.511			
Business model (Whole)	Reflective	MNPBM	0.654.	0.000	0.596	0.333
		CRBM	0.584			
		NPDBM	0.481			
Innovation performance	Reflective	New product feature performance	0.603	0.000	0.666	0.500
		New product market performance	0.667			
Organisation culture	Reflective	LOC	0.848	0.811	0.888	0.725
		LRT	0.836			
		TOR	0.871			
Organisation structure	Reflective	DEC	0.813	0.684	0.822	0.606
		FOR	0.731			
		SPE	0.790			

Table 8.42: Cross loading measurement (whole data)

	Activities	BM	Capabilities	Inno Performance	OrC	OrgS	Resources
Activities	**0.707**						
BM	0.724	**0.577**					
Capabilities	0.727	0.782	**0.707**				
Inno Performance	0.563	0.676	0.566	**0.707**			
OrC	0.579	0.808	0.619	0.62	**0.852**		
OrgS	0.6	0.751	0.564	0.541	0.683	**0.779**	
Resources	0.574	0.576	0.486	0.501	0.537	0.483	**0.707**

After the outer model examination, the structural (inner) model was assessed by conducting path analysis to examine the correlation between the construct (latent variables). By looking at Table 8.43, the correlation from resources to business model shows the t-value as 1.205 (less than 1.96), and the P-value as 0.228 (larger than 0.05). Therefore, because the path analysis value for H2 is not significant, it can be concluded

that resources do not have a significant impact on the business model when considering the entire dataset. Additionally, the R-square value is used to measure how much the independent variables explain the dependent variable.

When this value is above 0.5, it gives a middle range of explaining capacities. However, when it is larger than 0.75, it shows significance in explanation capabilities (Hair, 2013). However, the addressed model assessment in this section aims to develop the construct for the PLS-SEM analysis. The following sections will introduce the process and the results of the PLS-SEM model analysis sorted in the theme of business model types, innovation types and regions as the group analysis.

Table 8.43: Structural model evaluation checklist (whole data)

Hypo	Path	Path coeff	T Val	P Val	Hypo	R squ	f squ	q squ	95% CILL	95% CIUL	Fits
H1	Cap -> BM	0.341	6.341	0.0000	Accepted	0.801	0.242	0.016	0.237	0.449	SRMR=0.129 NFI=0.373 RMS_Theta=0.246
H2	Res -> BM	0.061	1.193	0.233	Not accepted	0.801	0.011	0.001	(0.025)	0.164	
H3	Act -> BM	0.178	2.886	0.0000	Accepted	0.801	0.064	0.004	0.066	0.307	
H4	BM -> InPer	0.749	20.634	0.0000	Accepted	0.560	1.275	0.002	0.663	0.810	
H5	OrC-> BM	0.458	7.295	0.0000	Accepted	0.801	0.565	0.045	0.333	0.576	
H6	BM -> OrgS	0.580	7.639	0.0000	Accepted	0.584	0.284	0.008	0.422	0.723	
H7	OrC -> OrgS	0.216	2.865	0.000	Accepted	0.584	0.039	0.008	0.067	0.359	

8.6 Group analysis

In order to test the research hypothesis, a group analysis was used to observe the effect of the group of interest (Beckmann et al., 2003). The group analysis employed two approaches: the PLS-MGA analysis examination and the SEM model (outer and inner) comparison. The first PLS-MGA provided statistical evidence to examine the relationship between constructs in the structural model. The subsequent model analysis focused on comparing the discrepancy of models in pairs by identifying the difference of the construct, indicators, and the construct's correlation (t-value analysis).

Group analysis can be initiated at the general level as the single-level mixed effect that aims to give a general and flexible framework resulting from the individual subject analysis (Beckmann et al., 2003). The output of the first stage analysis can be adopted for the second single group analysis (Beckmann et al., 2003). The established PLS-SEM model [gave] the construct of the group analysis by exploring the components of the specific business model, the interactions between the business model and organisational culture and structure, and how the specific business model facilitates innovation performance. Differently put, group analysis was employed to identify the differences between the three developed business models (NMPBM, CRBM and NPDBM) by justifying their associated components to distinguish the discrepancy of their architecture under different contexts: innovation types and regions.

8.6.1 The comparison of the business model types in single-level mixed method.

As mentioned earlier, the business model construct was divided into three categories: NMPBM, CRBM, and NPDBM. To test the hypothesis, individual subject group analysis was conducted using the entire dataset of 228 participants, along with the developed PLS-SEM model. This analysis aimed to examine the structure of the three business model constructs and validate the relationship between the latent variables and their corresponding components

The first run of the PLS-SEM focused on the NMPBM. After running the PLS-SEM algorithm to evaluate the outer models, the low outer loading variables (knowledge sharing capabilities, marketing capabilities, and open innovation capabilities) were removed from the capabilities construct. The subsequent bootstrapping method was executed to implement the path-analysis. A clear trend can be observed by looking at the results presented in the correlation between the latent variables. As Figure 8.3 shows, the path coefficient t-value from the resources to the NMPBM is 1.184 (less than 1.96)

indicating insignificant impact from resources to the NMPBM. However, the path analysis of the subsequent CRBM gives a different result that shows that both the t-value of resources and activities toward CRBM are less than 1.96 (resources to CRBM: 0.758 and activities to CRBM: 1.253). This observation indicates that in terms of the three proposed BM component constructs, only capabilities have a significant impact on the CRBM. Moreover, this [discrepancy] of the explored business models has emerged in the inner model and the outer model. As Figure 8.5 shows, the inner model of the NPDBM PLS-SEM shows that the impact from the activities to the NPDBM ones is insignificant (t-value: 0.328). In addition, by comparing with other two models, its outer model presents the addition and removal of the indicators. More specifically, from the previous two business model path analyses, the resources construct has an insignificant impact on the NMPBM and CRBM. However, in terms of the NPDBM, the t-value from the resources construct to NPDBM is significant (2.818) but it only contains intangible resources. In addition, marketing capabilities were included in the capabilities construct as the observable variable of NPDBM capabilities but not appear emerg in the NMPBM and CRBM model. Basically, the values presented in the three structural model evaluation checklists (NMPBM, CRBM and NPDBM) support the theoretical hypothesis that different business models reflect different configurations and its contained components.

Figure 8.3: The NMPBM model (whole data) after PLS bootstrapping

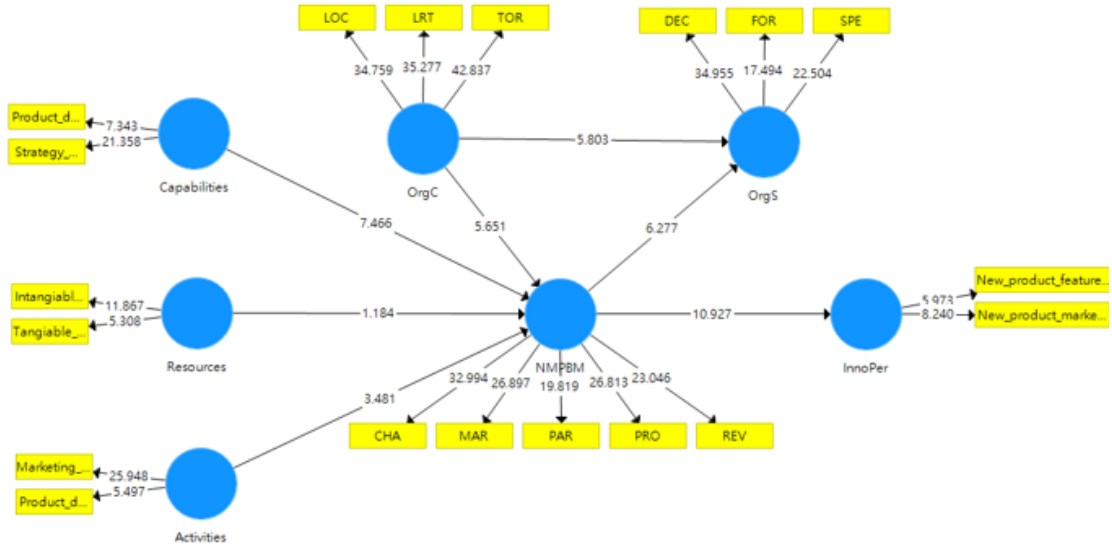


Figure 8.4: The CRBM model (whole data) after PLS bootstrapping

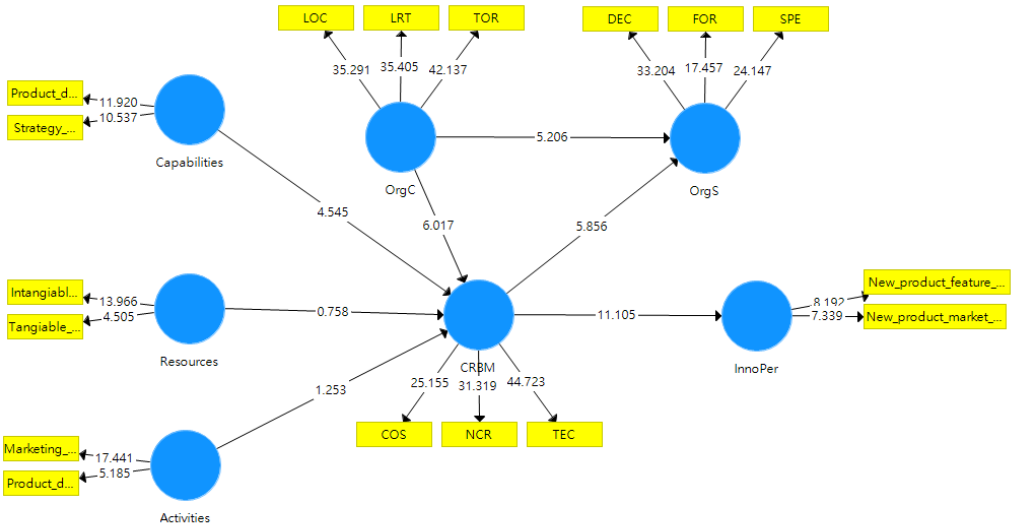
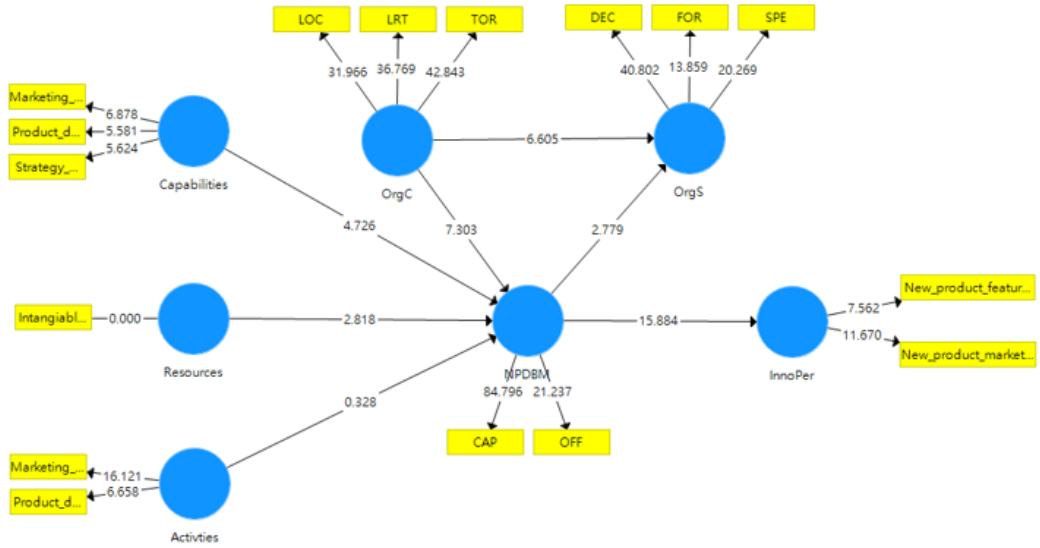


Figure 8.5: The NPDBM model (whole data) after PLS bootstrapping



8.6.2 A comparison of the business model architecture of different innovation types.

After the individual subject analysis, single group analysis was conducted to further analyse the differences among the groups under the same context. This section is focusing on comparing the NMPBM, CRBM and NPDBM under the context of the chosen innovation types. In this pursuit, the input data of the SmartPLS 3 was divided into radical innovation (77 samples) and incremental innovation (151…) from the whole dataset (248 samples) and were individually extracted to build the PLS-SEM models. This analysis aimed to examine the discrepancies of the three business models architecture under the different innovation product pursuits of the company. First, by adopting the NMPBM PLS model (whole data), the PLS Multi group analysis (MGA) was performed to identify the variance between the pair of a group in the same subject. The results of the MGA mean to

testify if the inner structural model can provide generality when testing in a different context. The MGA was run with the settings: Maximum literation: 300, stop criterion:7 and subsamples:100. Table 8.44 presents the results of the PLS-MGA analysis as the statistical evidence. The p-value in the path from resources to the NMPBM is 0.036, indicating the significance of the variance in the context of radical and incremental innovation. This finding refers to the impact of resources on NMPBM being varied when a company pursues innovative product development.

Table 8.44: PLS-MGA analysis NMPBM (radical vs incremental innovation)

	Path Coefficients-diff (NMPBM radical - NMPBM incremental)	p-Value original 1-tailed (NMPBM radical vs NMPBM incremental)	p-Value new (NMPBM radical vs NMPBM incremental)
Activities -> NMPBM	-0.057	0.661	0.678
Capabilities ->NMPBM	-0.128	0.845	0.309
NMPBM -> InnoPer	0.099	0.087	0.174
NMPBM -> OrgS	0.077	0.316	0.632
OrgC -> NMPBM	0.061	0.281	0.561
OrgC -> OrgS	-0.066	0.661	0.677
Resources -> NMPBM	0.161	0.036	0.072

Furthermore, by following the same procedure as mentioned in the previous section, the PLS-SEM analysis was conducted by adopting the previous two-phased examination. The first measurement model examination helps to eliminate the factors with low outer-loading (less than 0.4 and less than 0.5 if cause change of C.R. and AVE when removal) (Wong, 2019). After that examination, the following verification of the structural model means observing the results of the path analysis to compare the correlation between the constructs (latent variables). According to the measurement model examination results, the three business model types' observable variables (indicators) are identical to reflect the construct with the same indicators.

The first single group analysis compares the NMPBD in the context of radical and incremental innovations. As Figure 8.6 shows, the t-value from the activities construct to the NMPBM is 1.514, referring to insignificant impact of the independent variable (activities) on the dependent variable (NMPBM). Meanwhile, all the other paths in this model show larger figures than 1.96, meaning a significant correlation between the constructs is supported. However, when looking at the same business model construct in the context of incremental innovation (Figure 8.7), some prominent points of the

difference emerge. First, the reflective indicators of the capabilities are only two when the product capabilities is removed. Second, only intangible resources reflect the resources construct but still show an insignificant impact on the NMPBM (t value:0.001). In addition, despite activities significantly influencing the NMPBM (t value:1.853), the models' indicator only has marketing activities but excludes open innovation and product development innovation activities compared to the NMPBM/radical innovation. Furthermore, when looking at the path from NMPBM to innovation performance, the significance of the impact is shown on both the radical and incremental innovation contexts (t value: 16025 and 7155). Nevertheless, new product sales performance is absent in the incremental innovation performance construct. In other words, the NPDBM has no significant impact on new product sales performance under a company's pursuit of developing incremental innovation products.

In summary, the above results provide a crucial point that resources can have an impact on the NMPBM only with radical innovations, but not with incremental innovation. Meanwhile, the reflective indicators are varied in these two innovation types. Thus, regarding the NMPBM, it contains different components and generates varied outcomes under different innovation type pursuits.

Figure 8.6: The NMPBM model (radical innovation) after PLS bootstrapping

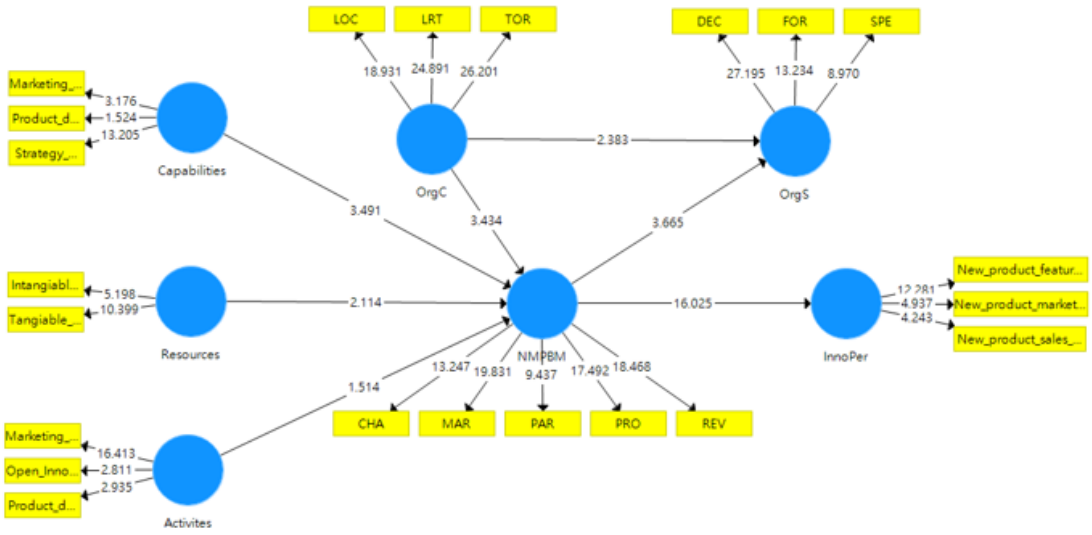
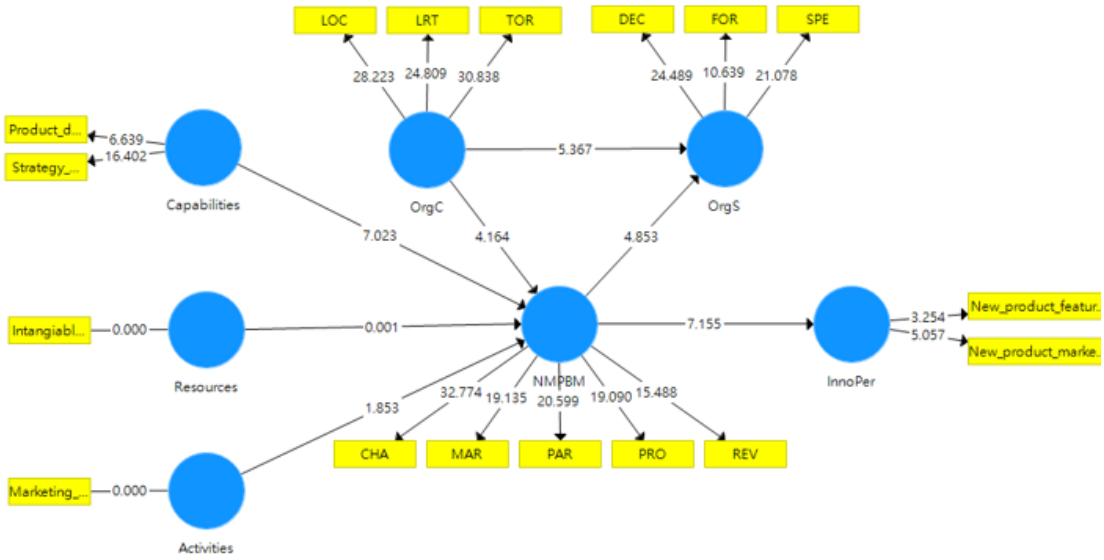


Figure 8.7: The NMPBM model (Incremental innovation) after PLS bootstrapping



In terms of CRBM, Table 8.45 gives the PLS-MGA results indicating that none of the paths shows significance in the variance between radical and incremental innovation.

Table 8.45: PLS-MGA analysis CRBM (radical vs incremental innovation)

	Path Coefficients-diff (Radical CRBM vs Incremental CRBM)	p-Value original 1-tailed (Radical CRBM vs Incremental CRBM)	p-Value new (Radical CRBM vs Incremental CRBM)
Activities -> CRBM	0.024	0.418	0.835
CRBM -> InnoPer	0.093	0.117	0.235
CRBM -> OrgS	-0.07	0.655	0.690
Capabilities -> CRBM	-0.172	0.866	0.267
OrgC -> CRBM	0.185	0.106	0.211
OrgC -> OrgS	-0.006	0.497	0.994
Resources -> CRBM	0.072	0.321	0.641

By following the same method to proceed with the single group analysis, the CRBM architecture was presented in the context of radical innovation (Figure 8.8) and incremental innovation (Figure 8.9). The discrepancy between the two outer models is prominent in the outer model since many of the reflective indicators that emerged in the CRBM/radical innovation model were not presented in the CRBM/incremental one. Similar to the results explored in the previous section, CRBM generates different outcomes associated with different components under different innovation pursuits.

However, an interesting observation is the fact that only capabilities show a significant impact on the CRBM in both innovation types, the product development capabilities indicator only emerged in the CRBM/radical model. In addition, new product sales merely reflect on the CRBM/radical model but not on both.

Figure 8.8: The CRBM model (radical innovation) after PLS bootstrapping

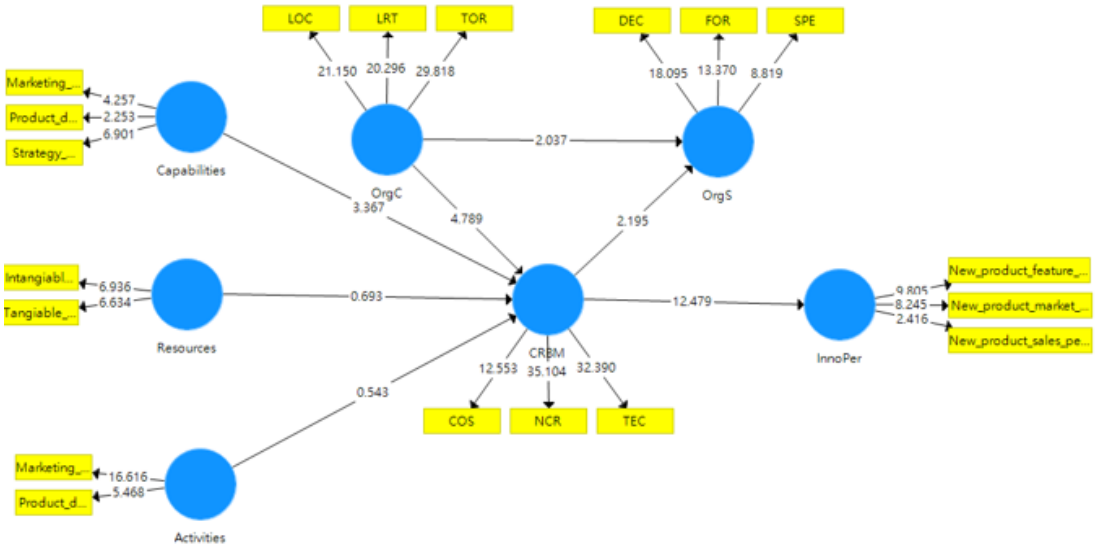
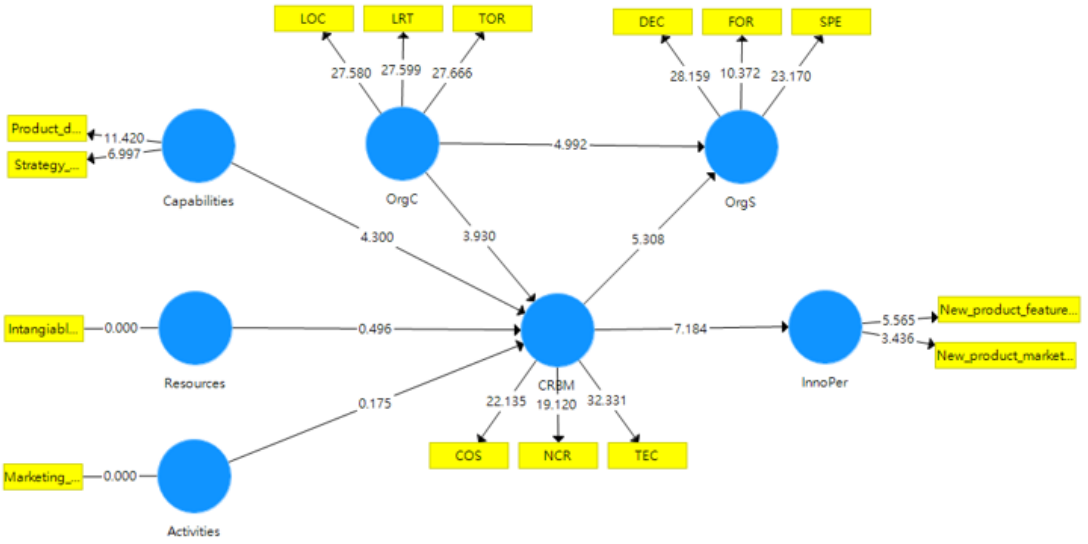


Figure 8.9: The CRBM model (incremental innovation) after PLS bootstrapping



Regarding the NPDBM, the PLS-MGA statistical result (Table 8.46) shows no significant variance (p-value less than 0.05) between radical and incremental data.

Table 8.46 PLS-MGA analysis NPDBM (radical vs incremental innovation)

	Path Coefficients-diff (Radical NPDBM - Incremental NPDBM)	p-Value original 1-tailed (Radical NPDBM vs Incremental NPDBM)	p-Value new (Radical NPDBM vs Incremental NPDBM)
Activities -> NPDBM	-0.127	0.794	0.413
Capabilities -> NPDBM	-0.051	0.635	0.731
NPDBM -> InnoPer	0.054	0.239	0.477
NPDBM -> OrgS	0.159	0.201	0.401
OrgC -> NPDBM	0.145	0.125	0.251
OrgC -> OrgS	-0.115	0.739	0.523
Resources -> NPDBM	0.032	0.435	0.870

A comparison between the identical models in the subject of radical and incremental innovation was made using t-tests to observe the discrepancy. For instance, the correlation between capabilities to the NPDBM is all significant (t-value 2.788 and 3.687) in radical innovation (Figure 8.10) and incremental innovation (Figure 8.11) with the same set of indicators (marketing, product development and strategy management capabilities). However, the path from resources to the CRBM presents the t-value of 1.333 (insignificance) in the NPDBM/radical model but 1.975 (significance) in the NPDBM/incremental model without tangible resource indicators to reflect the resources construct. Nevertheless, under radical or incremental innovation context, the activities construct is positively correlated to the NPDBM (t-value: 0.991 and 0.003).

Figure 8.10: The NPDBM model (radical innovation data) after PLS bootstrapping

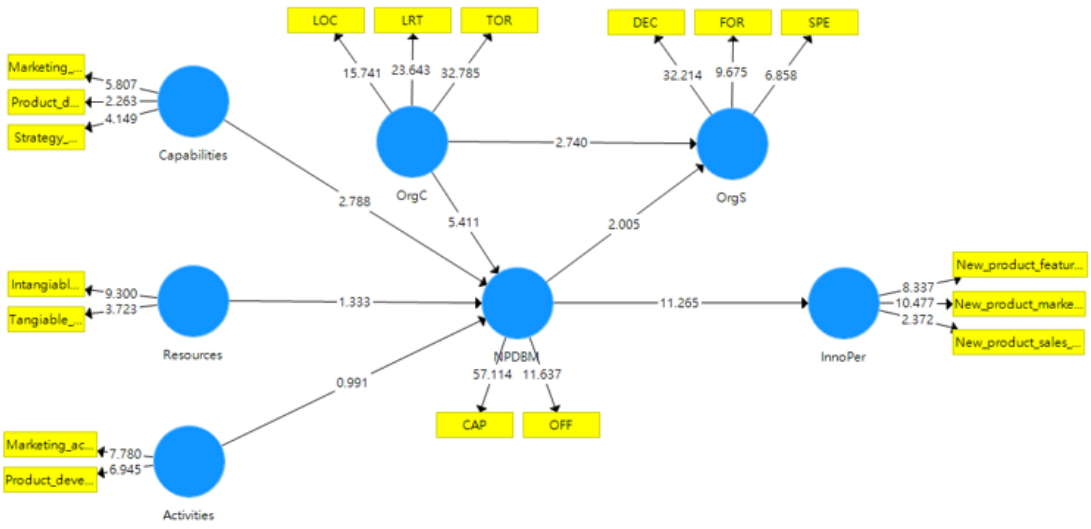
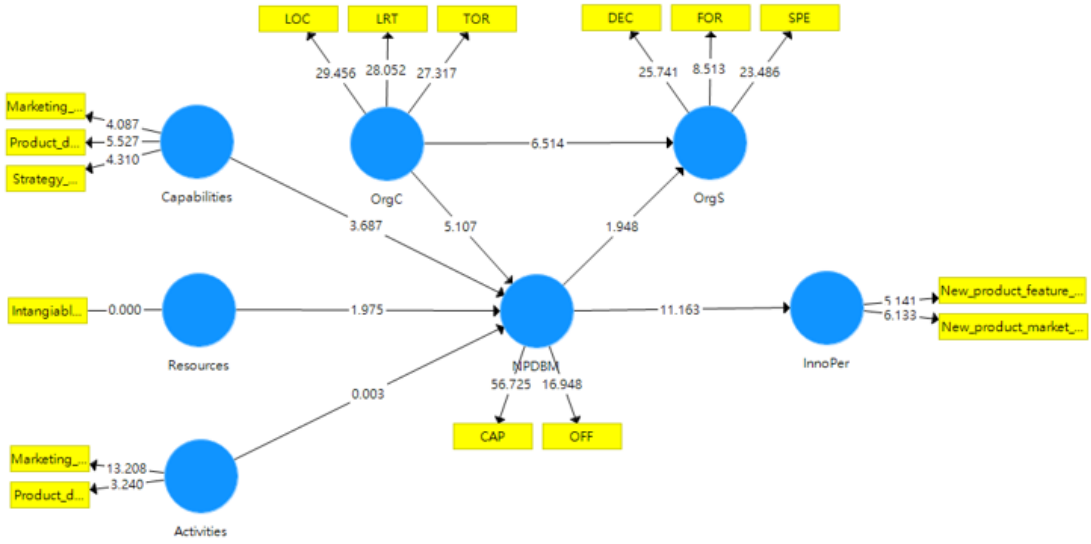


Figure 8.11: The NPDBM model (Incremental innovation data) after PLS bootstrapping



In sum, under the context of radical and incremental innovation, the results derived from the comparison support the theoretical proposition that different business models have different architectures associated with a unique set of components. In addition, when a certain kind of business model is operated under different innovation pursuits, its architecture and the associated components will alter and generate multiple outcomes. Meanwhile, the ways organisational culture and structure work with business models are examined and showed the interaction as the theoretical proposition suggested.

8.6.3 The comparison of the business model architecture in different regions.

Apart from an examination of the business model architecture under various innovation type pursuits, the impact of organisational culture and structure are also the concern of this study. More specifically, organisational culture refers to various impacts on subjects (Liu et al., 2006). Hence, the following group analysis will be dedicated to the subject of regions by observing the variance between the business model architecture under the context of the UK and TW.

The results of the PLS-MGA analysis of NMPBM to compare the variance between the UK and TW is presented in Table 8.47. The statistical results show evidence that the variance of NMPBM appeals when it is operated in various regions, and the difference is to the innovation performance and how organisational culture affects the NMPBM since the P-values are all below 0.05.

Table 8.47: PLS-MGA analysis NMPBM (UK vs TW)

	Path Coefficients-diff (NMPBM UK - NMPBM TW)	p-Value original 1-tailed (NMPBM UK vs NMPBM TW)	p-Value new (NMPBM UK vs NMPBM TW)
Activities -> NMPBM	0.068	0.289	0.577
Capabilities -> NMPBM	-0.217	0.968	0.064
NMPBM -> InnoPer	0.331	**0.000**	**0.000**
NMPBM -> OrgS	0.201	0.108	0.217
OrgC -> NMPBM	0.250	**0.007**	**0.014**
OrgC -> OrgS	-0.062	0.665	0.670
Resources -> NMPBM	-0.019	0.601	0.798

Besides, by observing the NMPBM model corresponding to the context of the business model environment (UK and TW), the discrepancy does not appear in the structural model since capabilities is the only variable to significantly influence the NPDBM (t-value: 4.289 and 7.512) in both business environments. Moreover, the correlation between NMPBM and innovation performance was tested and found to be significantly positive (t-value: 24.211 and 4.926). In terms of the interaction between organisational elements and MNPBM, the t-test show significance from organisational culture to NPDBM (5.377 and 2.306), NPDBM to organisational structure (4.770 and 2.558) as well as the organisational culture to the structure (3.320 and 4.403). However, although capabilities are verified to have a significant positive correlation to the NPDBM in both regions, its indicator cluster is not consistent: the product innovation capabilities indicator emerged in the UK region to reflect the capabilities but not in TW. It might indicate the culture has different impact in different region. Also, product sales performance emerges in the U.K innovation performance only.

Figure 8.12: The NMPBM model (UK) after PLS bootstrapping

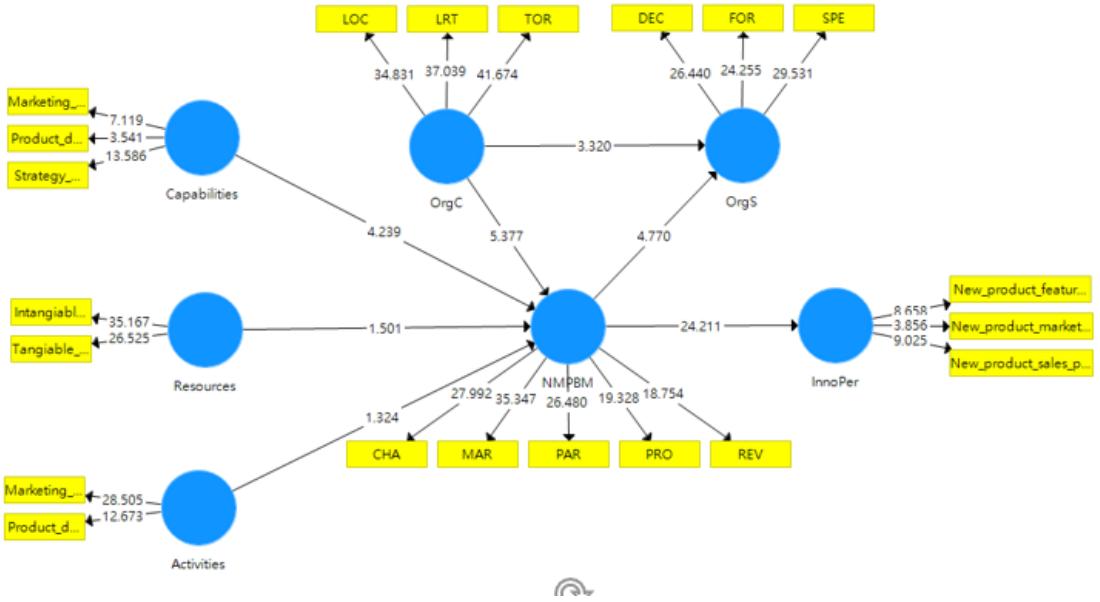
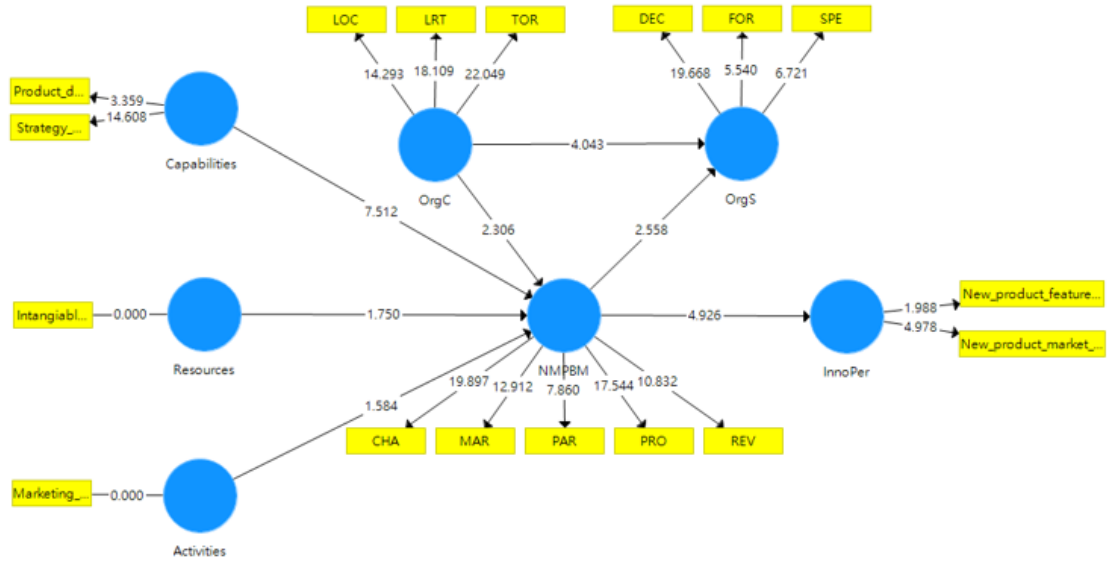


Figure 8.13: The NMPBM model (TW) after PLS bootstrapping



In Table 8.48, the PLS-MGA analysis shows that the CRBM structural models in the UK and TW are identical except that the P-value of innovation performance is lower than 0.05.

Table 8.48: PLS-MGA analysis CRBM (UK vs TW)

	Path Coefficients-diff (UK CRBM - TW CRBM)	p-Value original 1-tailed (UK CRBM vs TW CRBM)	p-Value new (UK CRBM vs TW CRBM)
Activities -> CRBM	-0.007	0.537	0.926
CRBM -> InnoPer	0.271	**0.000**	**0.000**

CRBM -> OrgS	0.140	0.202	0.403
Capabilities -> CRBM	0.073	0.348	0.696
OrgC -> CRBM	0.104	0.248	0.497
OrgC -> OrgS	0.038	0.403	0.807
Resources -> CRBM	-0.177	0.849	0.301

Nevertheless, when conducting a comparison of Figures 8.14 and 8.15, the structure of the CRBM/UK and CRBM/TW still have lots of things in common, namely the capabilities construct is the only business component that significantly influences the CRBM in both regions. However, in the CRBM/UK model, three indicators (marketing, product development, and strategy management capabilities) emerged to reflect the capabilities but only the product development capabilities indicator is left in the CRBM/TW model. Even though the indicators of resources and activities clusters also vary in the UK and TW, since these two latent variables have no significance on the impact of the CRBM.

Figure 8.14: The CRBM model (UK) after PLS bootstrapping

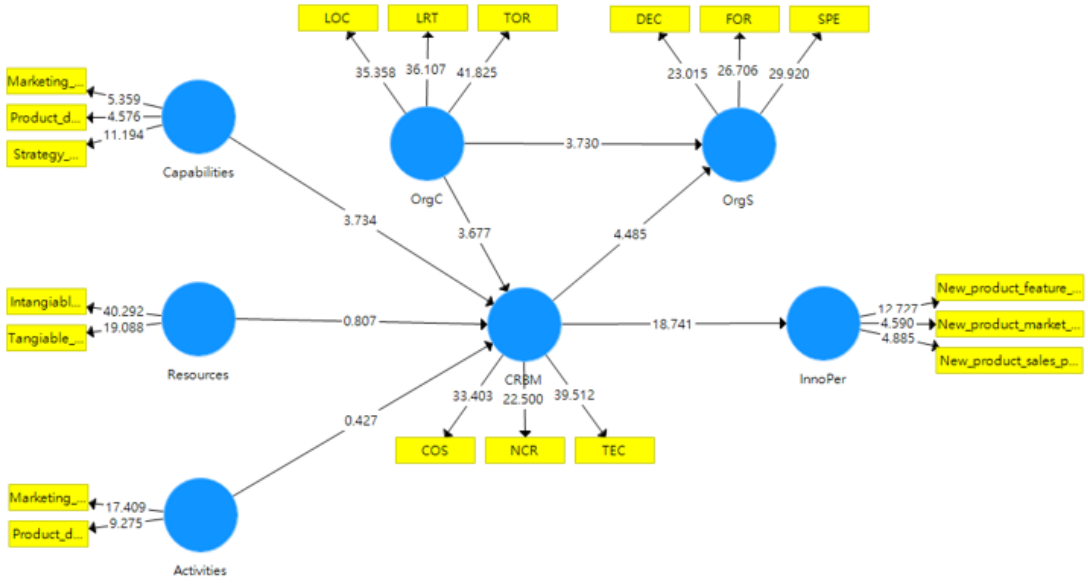
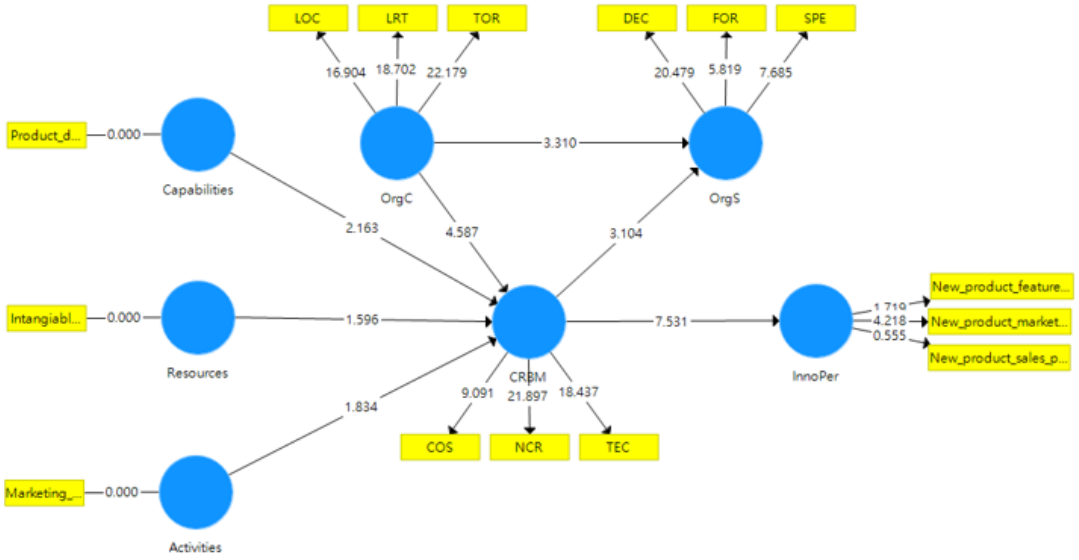


Figure 8.15: The CRBM model (TW) after PLS bootstrapping



The final single group comparison relates to identifying the difference between NPDBM/UK and NPDBM/TW. The PLS-MGA analysis shows that innovation has significant variance among all the paths of NPDBM in the UK and TW (Table 8.49).

Table 8.49: PLS-MGA analysis NPDBM (UK vs TW)

	Path Coefficients-diff (UK NPDBM - TW NPDBM)	p-Value original 1-tailed (UK NPDBM vs TW NPDBM)	p-Value new (UK NPDBM vs TW NPDBM)
Activities -> NPDBM	0.161	0.150	0.300
Capabilities -> NPDBM	-0.176	0.886	0.228
NPDBM -> InnoPer	0.240	0.000	0.001
NPDBM -> OrgS	0.119	0.211	0.421
OrgC -> NPDBM	0.255	0.016	0.032
OrgC -> OrgS	0.049	0.362	0.723
Resources -> NPDBM	-0.158	0.929	0.142

However, the following comparison regarding these two models was conducted by observing the connection between constructs (t-test). In terms of the business construct, the capabilities indicator is the only one that is significantly positive to the NPDBM (t-value: 2.403). Comparatively, in the NPDBM/TW, the construct of resources is verified to influence the business model with a t-value 3.026. Another interesting point is that, from the model in Figure 8.16, the path from NPDBM to OrgS presents the t-value of 1.776 (less than 1.96). The given numerical value refers to the insignificant correlation between these two variables. In other words, NPDBM will not affect the organisational structure in the Taiwan business environment.

Figure 8.16: The NPDBM model (UK) after PLS bootstrapping

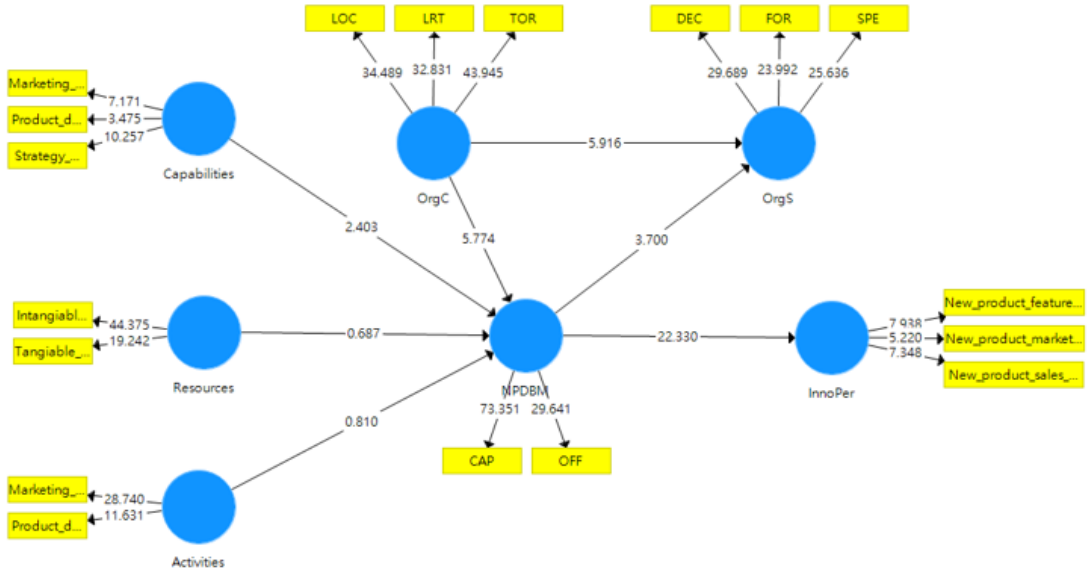
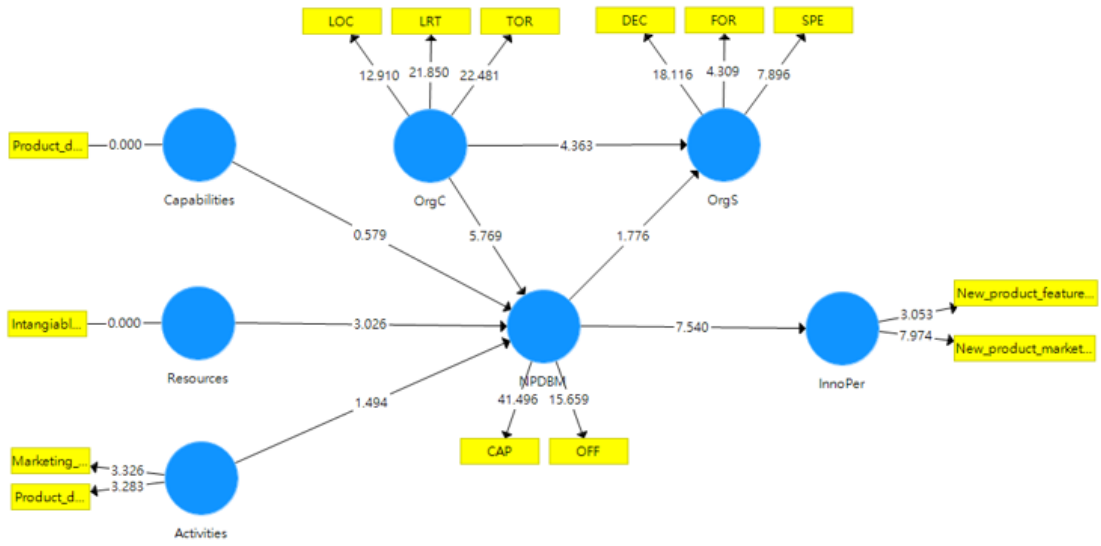


Figure 8.17: The NPDBM model (TW) after PLS bootstrapping



In the regional comparison, the structural models of NMPBM and CRBM did not show a significant difference between the UK and TW. Capabilities is the only business component that significantly and positively affects the business model to facilitate innovation performance. However, when it comes to the NPDBM, the impact factor does not show consistency. For instance, capabilities latent variable is the only factor affecting the NPDNM in the UK, instead, resources plays the same role in NPDBM/TW model. In addition, the innovation performance indicators of the same business model change in

different regions. Another interesting observation is that the business model does not always significantly influence the organisational structure, according to the model of NPDBM/TW.

8.6.4 Conclusion

To sum up, the discrepancy in the business models has been observed with clear evidence. As for the outer model, each construct has its affirmed components (indicators) which are not consistent with the others even under the same context. In addition, the inner model analysis was tested by looking at the correlation between constructs. T-value analysis was employed to identify whether a significantly positive influence exists in the path from the independent variable to the dependent variables. The discrepancies were found and demonstrated after the group analysis.

Moreover, comparing the 15 models demonstrates a few exciting observations by looking at the particular pairs of business model architecture and outcomes. Specifically, when adding the factors of the business environment (regions), The NMPBM/Incremental type and the NMPBM/TW type have similar business model composition and outcomes. Furthermore, CRBM/Radical and CRBM/UK are identical concerning their structure and performance indicators. Regarding NPDBM, the radical innovation business model shares the same architecture and outcomes as the UK cases but has enormous differences from the TW samples. Moreover, the findings also imply that the radical innovation business model construct is more consistent to the UK samples and the incremental innovation model construct has significant similarities to the TW samples.

The examination of the 15 SEM models is presented in appendix J in sequence. Generally, due to similar reasons as discussed previously, the internal consistency could not be well tested because the latent variables in this research framework are also causal variables. Therefore, some of the figures are not able to reach the statistical satisfactory level. Nevertheless, the path analysis still provides a clear picture to answer the research question. The discussion will be addressed in section 8.8.

8.7 Invariance analysis

Invariance analysis is designed to investigate whether there are any invariances across the sub-groups to ensure the research findings will have generality (Lai and Li, 2005). In other words, when the research involves comparing groups or cultures, the research participants might not share the same concept that the researcher intended when asking the questions. Hence, invariance analysis has been emphasised to be important for examining model generalization in cross-cultural and cross-national research (Merz et al., 2008). As mentioned, this study collected data from the UK and TW to explore the discrepancy of the business model configurations based on the addressed theoretical proposition; hence, measuring the invariance is crucial to indicate whether any differences emerged in the questionnaire surveys across companies in different regions.

By employing Partial Least Squares Multi-Group Analysis (PLS-MGA), the data were compared in the base of the whole dataset associating with the PLS-SEM model to examine if any variance occurs between the UK and TW. Table 8.50 shows the results of the invariance analysis by which the p-value is expected to be larger than 0.05 implying insignificant difference between these two regions. However, the given figures do not all reach the extent that variance is minimised.

Table 8.50: PLS-MGA analysis

	Path Coefficients-diff (UK whole – TW Whole)	p-Value original 1-tailed (UK whole vs TW Whole)	p-Value new (UK whole vs TW Whole)
Activities -> BM	0.022	0.424	0.849
BM -> InnoPer	0.277	**0.000**	**0.000**
BM -> OrgS	0.320	**0.028**	**0.056**
Capabilities -> BM	-0.145	0.904	0.191
OrgC -> BM	0.224	**0.025**	**0.049**
OrgC -> OrgS	-0.173	0.857	0.287
Resources -> BM	-0.095	0.825	0.350

Helsper and Gerber (2012) explained the difficulties in measuring invariance in cross-national research. According to their perspective, language translation and the way to deliver the message (such as internet using habits) to adjust to regional culture frequently leads to failure of detecting invariances. Therefore, in terms of the path (BM ->innovation, BM-> Orgs, and OrgC -> BM) that present the p-value being less than 0.05, this might be affected by the mentioned issues and could not demonstrate model generalisation as expected. Hence, the cross-country study is suggested to analyse the essential engagement

issues, such as access and infrastructure, instead of a descriptive study like this research aims to do.

8.8 Discussion and conclusion

The entire statistical analysis was conducted based on the research hypotheses to observe the correlation between the proposed constructs and their associated indicators and to identify the discrepancies of business models. The most striking observation that emerged from the analysis can be addressed in three aspects: first, the verification of the heterogeneity of business model configuration and the derived outcomes, second, the comprised components' evolution emerged when the identical business models were executed in varied circumstances (innovation types, regions), and third. the interactions between business model, organisational culture and structure will not always be the same in different regions. These findings involve not merely the explored three business model types, but the ways their architecture alter to facilitate the emergence of the intended innovation performance.

8.8.1 The heterogeneity of BM types generates different outcomes

This study has two significant findings. Firstly, the exploration of three business model types (NMPBM, CRBMM, and NPDBM) highlights their unique architecture and components. Grounded in the RBV theory, these findings confirm the existence of multiple business model configurations and their corresponding architecture, components, and resulting performance variations. Notably, the CRBM stands out with new product sales as a specific indicator of innovation performance. Secondly, the study establishes a clear link between strategic decisions and the configuration of business elements, leading to distinct performance outcomes. The analysis provides valuable insights into the validation of business model variations, the complexities of business model configurations, and the chronology of key decision-making in transforming technology innovation into different value for companies.

8.8.2 The heterogeneity of BM architecture changes in different contexts

Besides, the architecture of a specific business model will not always stay consistent. It will evolve its contained components and how they interact to adapt to various circumstances. Table 8.51 shows that when comparing NPDBM in the context of two innovation pursuits, a key difference is that both capabilities and resources significantly impact the NMPBM. However, only capabilities can be seen as having a positive impact on the NMPBM in the incremental context and with two indicators only (marketing capabilities being excluded).

NMPBM has a significantly positive correlation to innovation performance in radical innovation. However, this finding is not consistent in incremental innovation since new product sales were not included in the indicators cluster to reflect innovation performance. Also, by comparing the architecture in regions, the capabilities in the NMPBM/TW model contains product development and strategy management indicators (excluding marketing capabilities) which significantly affect the NMPBM but generate innovation performance without product sales compared to the UK.

The same circumstances also emerge in Tables 8.52 and 8.53 to demonstrate the variance between business models (CRBM and NPDBM) and how a single business model evolves in different contexts.

The analysis in this section brings a valuable contribution to the existing research by emphasizing the connection between the diversity of business models and their adaptability to different types of innovation. By identifying multiple business model configurations, it offers insights into the various strategies that firms can utilize to improve their competitive edge through product innovation. These findings not only expand our understanding of the relationship between business model configuration and innovation performance but also present new opportunities for further exploration and comparative analysis in this area of study.

Table 8.51 A comparison of the NMPBM architecture

BM type	Path hypothesis		Whole	Radical	Incremental	UK	TW
NMP	Capabilities->NMPBM	Marketing		X		X	
		Produce development	X	X	X	X	X
		Strategy management	X	X	X	X	X
	Resources -> NMPBM	Intangible resources	X	X	X	X	X
		Tangible resources	X	X		X	
	Activities -> NMPBM	Marketing	X	X	X	X	X
		Open innovation		X			
		Product development	X	X		X	
	NMPBM->InnoPerfonce	New [produce] feature	X	X	X	X	X
		New product market	X	X	X	X	X
		New product sales		X		X	
	OrgC -> NMPBM	LOC	X	X	X	X	X

		LRT	X	X	X	X	X
		TOR	X	X	X	X	X
	NMPBM-> OrgS	DEC	X	X	X	X	X
		FOR	X	X	X	X	X
		SPE	X	X	X	X	X
	OrgC->OrgS	LOC	X	X	X	X	X
		LRT	X	X	X	X	X
		TOR	X	X	X	X	X

The “X” means the indicator is adopted in the PLS-SEM examination.

The “grayscale” means the latent variable has no significant impact on the dependent variables.

Table 8.52 A comparison of the CRBM architecture

BM type	Path hypothesis		Whole	Radical	Incremental	UK	TW
CR	Capabilities-> CEBM	Marketing		X		X	
		Product development	X	X	X	X	X
		Strategy	X	X	X	X	
	Resources -> CEBM	Intangible resources	X	X	X	X	X
		Tangible resources	X	X		X	
	Activities -> CEBM	Marketing	X	X	X	X	X
		Open innovation					
		Product development	X	X		X	
	CRBM -> InnoPerfonce	New [produce] feature	X	X	X	X	X
		New product market	X	X	X	X	X
		New product sales	X	X		X	X
	OrgC -> CRBM	LOC	X	X	X	X	X
		LRT	X	X	X	X	X
		TOR	X	X	X	X	X
	CRBM -> OrgS	DEC	X	X	X	X	X
		FOR	X	X	X	X	X
		SPE	X	X	X	X	X
	OrgC->OrgS	LOC	X	X	X	X	X
		LRT	X	X	X	X	X
		TOR	X	X	X	X	X

The “X” means the indicator is adopted in the PLS-SEM examination.

The “grayscale” means the latent variable has no significant impact on the dependent variables.

Table 8.53 A comparison of the NPDBM architecture

BM type	Path hypothesis		Whole	Radical	Incremental	UK	TW
NPD	Capabilities-> NPDBM	Marketing	X	X	X	X	
		Product development	X	X	X	X	X
		Strategy	X	X	X	X	
	Resources -> NPDBM	Intangible resources	X	X	X	X	X
		Tangible resources		X		X	
	Activities -> NPDBM	Marketing	X	X	X	X	X
		Open innovation					
		Product development	X	X	X	X	X
	NPDBM->InnoPerfonce	New [produce] feature	X	X	X	X	X
		New product market	X	X	X	X	X
		New product sales		X		X	
	OrgC -> NPDBM	LOC	X	X	X	X	X
		LRT	X	X	X	X	X
		TOR	X	X	X	X	X
	NPDBM -> OrgS	DEC	X	X	X	X	X
		FOR	X	X	X	X	X
		SPE	X	X	X	X	X
	OrgC->OrgS	LOC	X	X	X	X	X
		LRT	X	X	X	X	X
		TOR	X	X	X	X	X

The “X” means the indicator is adopted in the PLS-SEM examination.

The “grayscale” means the latent variable has no significant impact on the dependent variables.

8.8.3 The interaction between BM, OC and OS

The quantitative findings regarding the influence of organizational culture and structure on the business model largely support the research hypothesis, except for the TW case. However, in the TW scenario, unlike in other cases, the business model does not have a significant impact on the organizational structure, as shown in Table 8.47. This finding challenges the conventional belief in the mutual and causal relationship between organizational culture and structure and their importance for a firm's competitive advantage. It offers valuable insights into the impact of the business model on new product development and suggests that achieving harmony may not lead to identical outcomes in

different cultural contexts. This highlights the need for a nuanced understanding of the dynamics between organizational culture, structure, and business models

8.8.4 Research hypothesis catalogue

As a reminder, this study aims to explore the variety of the components of different business models and the different outcomes they generate. Thus, this section will employ a hypothesis catalogue about the group analysis results to examine if any variance emerged.

The below research hypothesis catalogue (table 8.48) is presented in two bodies. Hypothesis one to seven means to examine the three business models' discrepancy by confirming their factors (architecture), the associated indicators (business elements), and the generated innovation performance. Consequently, the reviewed findings derived from the quantitative survey provides evidence that a business model evolves by changing its architecture and components to generate different outcomes in the context of varying innovation pursuits and business environments (hypothesis eight to eleven). Holistically, the variance presented in the research finding backs the hypotheses by successfully showing the discrepancy between business models and their generated outcome in various contexts.

Table 8.54 Hypothesis catalogue

Hypothesis:	**BM type (Construct):**	**Results:**	**Affirmed components (Indicators):**
1: Capabilities will have a positive relationship with a business model.	NMPBM:	Whole data: Supported	Pdct D/Strgy M
		Radical innovation: Supported	Pdct D/Strgy M/Mkting
		Incremental innovation: Supported	Pdct D/Strgy M
		U.K: Supported	Pdct D/Strgy M/Mkting
		TW: Supported	Pdct D/Strgy M
	CRBM:	Whole data: Supported	Pdct D/Strgy M
		Radical innovation: Supported	Pdct D/Strgy M/Mkting
		Incremental innovation: Supported	Pdct D/Strgy M
		U.K: Supported	Pdct D/Strgy M/Mkting
		TW: Supported	Pdct D
	NPDBM:	Whole data: Supported	Pdct D/Strgy M/Mkting
		Radical innovation: Supported	Pdct D/Strgy M/Mkting
		Incremental innovation:	Pdct D/Strgy M/Mkting
		U.K: Supported	Pdct D/Strgy M/Mkting
		TW: Not Supported	N/A
2: Resources will have a positive relationship with a business model.	NMPBM:	Whole data: Not supported	N/A
		Radical innovation: Supported	Intangible/Tangible
		Incremental innovation: Not supported	N/A
		U.K: Not supported	N/A
		TW: Not supported	N/A
	CRBM:	Whole data: Not supported	N/A
		Radical innovation: Not supported	N/A
		Incremental innovation: Not supported	N/A
		U.K: Not supported	N/A
		TW: Not supported	N/A

	NPDBM:	Whole data: Supported	Intangible
		Radical innovation: Not supported	N/A
		Incremental innovation: Supported	Intangible
		U.K: Not supported	N/A
		TW: Supported	Intangible
3: Activities will have a positive relationship with a business model.	NMPBM:	Whole data: Supported	Mketing/Prdt D
		Radical innovation: Not supported	N/A
		Incremental innovation: Not supported	N/A
		U.K: Not supported	N/A
		TW: Not supported	N/A
	CRBM	Whole data: Not supported	N/A
		Radical innovation: Not supported	N/A
		Incremental innovation: Not supported	N/A
		U.K: Not supported	N/A
		TW: Not supported	N/A
	NPDBM:	Whole data: Not supported	N/A
		Radical innovation: Not supported	N/A
		Incremental innovation: Not supported	N/A
		U.K: Not supported	N/A
		TW: Not supported	N/A
4: A business model will have a positive relationship with a company's innovation performance.	NMPBM:	Whole data: Supported	NPD feature/NPD market
		Radical innovation: Supported	NPD feature/NPD market/NPD sales
		Incremental innovation: Supported	NPD feature/NPD market
		U.K: Supported	NPD feature/NPD market/NPD sales
		TW: Supported	NPD feature/NPD market
	CRBM	Whole data: Supported	NPD feature/NPD market/NPD sales
		Radical innovation: Supported	NPD feature/NPD market/NPD sales
		Incremental innovation: Supported	NPD feature/NPD market
		U.K: Supported	NPD feature/NPD market/NPD sales

		TW: Supported	NPD feature/NPD market/NPD sales
	NPDBM	Whole data: Supported	NPD feature/NPD market
		Radical innovation: Supported	NPD feature/NPD market/NPD sales
		Incremental innovation: Supported	NPD feature/NPD market
		U.K: Supported	NPD feature/NPD market/NPD sales
		TW: Supported	NPD feature/NPD market
5: Organisational culture will have a positive relationship with a company's business model.	NMPBM:	Whole data: Supported	LOC/LRT/TOR
		Radical innovation: Supported	LOC/LRT/TOR
		Incremental innovation: Supported	LOC/LRT/TOR
		U.K: Supported	LOC/LRT/TOR
		TW: Supported	LOC/LRT/TOR
	CRBM	Whole data: Supported	LOC/LRT/TOR
		Radical innovation: Supported	LOC/LRT/TOR
		Incremental innovation: Supported	LOC/LRT/TOR
		U.K: Supported	LOC/LRT/TOR
		TW: Supported	LOC/LRT/TOR
	NPDBM:	Whole data: Supported	LOC/LRT/TOR
		Radical innovation: Supported	LOC/LRT/TOR
		Incremental innovation: Supported	LOC/LRT/TOR
		U.K: Supported	LOC/LRT/TOR
		TW: Supported	LOC/LRT/TOR
6: A business model will have a positive relationship with a company's organisational	NMPBM:	Whole data: Supported	DEC/FOR/SPE
		Radical innovation: Supported	DEC/FOR/SPE
		Incremental innovation: Supported	DEC/FOR/SPE
		U.K: Supported	DEC/FOR/SPE
		TW: Supported	DEC/FOR/SPE
	CRBM	Whole data: Supported	DEC/FOR/SPE
		Radical innovation: Supported	DEC/FOR/SPE
		Incremental innovation: Supported	DEC/FOR/SPE

structure.		U.K: Supported	DEC/FOR/SPE
		TW: Supported	DEC/FOR/SPE
	NPDBM	Whole data: Supported	DEC/FOR/SPE
		Radical innovation: Supported	DEC/FOR/SPE
		Incremental innovation: Supported	DEC/FOR/SPE
		U.K: Supported	DEC/FOR/SPE
		TW: Not supported	N/A
7: Organisational culture will positively affect a company's organisational structure.	NMPBM:	Whole data: Supported	LOC/LRT/TOR
		Radical innovation: Supported	LOC/LRT/TOR
		Incremental innovation: Supported	LOC/LRT/TOR
		U.K: Supported	LOC/LRT/TOR
		TW: Supported	LOC/LRT/TOR
	CRBM	Whole data: Supported	LOC/LRT/TOR
		Radical innovation: Supported	LOC/LRT/TOR
		Incremental innovation: Supported	LOC/LRT/TOR
		U.K: Supported	LOC/LRT/TOR
		TW: Supported	LOC/LRT/TOR
	NPDBM	Whole data: Supported	LOC/LRT/TOR
		Radical innovation: Supported	LOC/LRT/TOR
		Incremental innovation: Supported	LOC/LRT/TOR
		U.K: Supported	LOC/LRT/TOR
		TW: Supported	LOC/LRT/TOR

Hypothesis:	**BM type (Construct):**	**Results:**
8: Different business models have various architecture and/or comprised components to generate multiple outcomes.	NMPBM:	Whole data: Supported
		Radical innovation: Supported
		Incremental innovation: Supported
		U.K: Supported
		TW: Supported

	CRBM	Whole data: Supported
		Radical innovation: Supported
		Incremental innovation: Supported
		U.K: Supported
		TW: Supported
	NPDBM	Whole data: Supported
		Radical innovation: Supported
		Incremental innovation: Supported
		U.K: Supported
		TW: Supported
9: Business model components evolve in different pursuits of innovative product development	NMPBM:	Whole data: Supported
		Radical innovation: Supported
		Incremental innovation: Supported
		U.K: Supported
		TW: Supported
	CRBM	Whole data: Supported
		Radical innovation: Supported
		Incremental innovation: Supported
		U.K: Supported
		TW: Supported
	NPDBM	Whole data: Supported
		Radical innovation: Supported
		Incremental innovation: Supported
		U.K: Supported
		TW: Supported
	NMPBM:	Whole data: Supported
		Radical innovation: Supported
		Incremental innovation: Supported
		U.K: Supported

10: Business model components evolve when operating in different regions		TW: Supported
	CRBM	Whole data: Supported
		Radical innovation: Supported
		Incremental innovation: Supported
		U.K: Supported
		TW: Supported
	NPDBM	Whole data: Supported
		Radical innovation: Supported
		Incremental innovation: Supported
		U.K: Supported
		TW: Supported
11: The interaction of a business model, organisational culture and structure will be different when the business model operates in various regions.	MNPBM:	Whole data: Not supported
		Radical innovation: Not supported
		Incremental innovation: Not supported
		U.K: Not supported
		TW: Not supported
	CRBM	Whole data: Not supported
		Radical innovation: Not supported
		Incremental innovation: Not supported
		U.K: Not supported
		TW: Not supported
	NPDBM	Whole data: Supported
		Radical innovation: Supported
		Incremental innovation: Supported
		U.K: Supported
		TW: Supported

8.8.5 The integration of the BM implementation and technical innovation framework

Based on the literature, a successful business model generates revenue for a company by making strategic decisions and offering products or services to the market. It is essential for companies to systematize their decision-making process to improve revenue generation, manage costs, and mitigate risks. This perspective emphasizes the potential of innovation in shaping the business model.

Foss and Saebi (2016) argued that the innovation of business model can be dimensionalised into modular and architectural based on the scope (modular and architectural), and novelty (new to the firm or to the industry). Hence, four types of BMI were introduced: evolutionary, adaptive, Focused, and complex. To be specific, "Adapting BMI" relates to how companies change their BM to respond to external changes (Nancy M. P. Bocken, 2016). The "fine-tuning" (evolutionary BMI) of an individual BM component is relevant to its spontaneous change over time as endogenous innovation (Baden-Fuller and Morgan, 2010, Sitoh et al., 2014). Focus BMI is about innovate one specific area within BM, and complex BMI cause the entire BM focus and the associated configuration changed

Building on this idea and the research question: the correlation between the multiple business model configurations and the technology innovation outcomes has been given evidence to reaches the research objectives partly. However, "how" the business model discrepancy enables a firm to capture value through facilitating the innovation performance has not been fully answered.

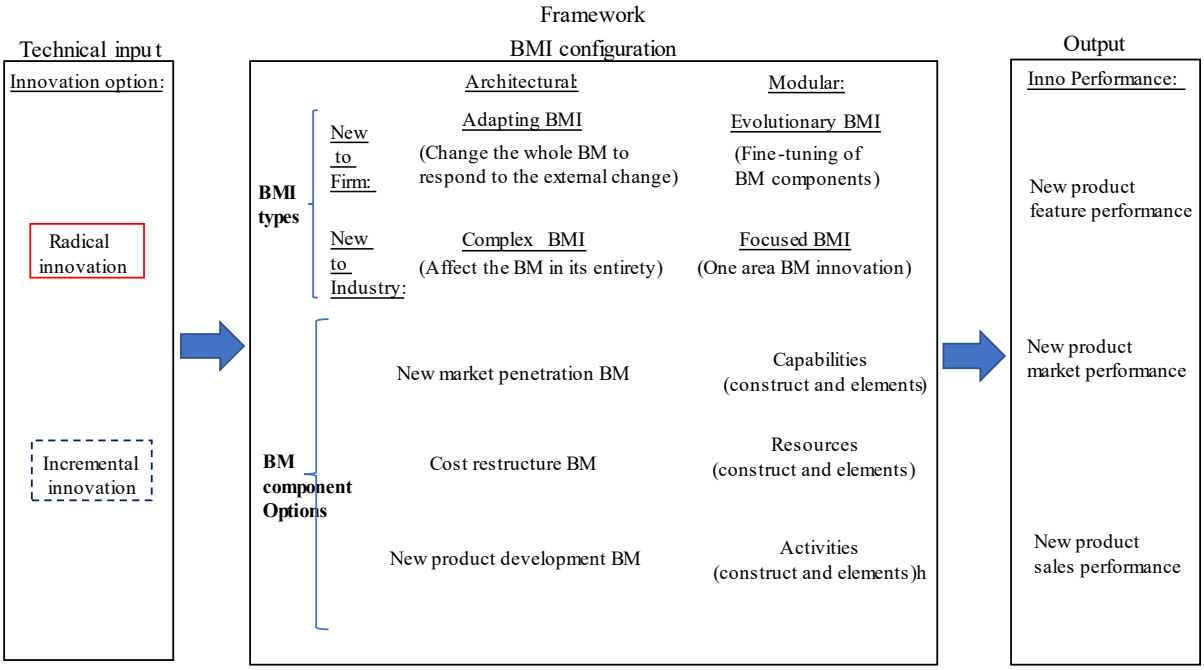
Despite that, this thesis supports and elaborates the sequential implementation of the business model is recommended by considering the required architecture and components that align with the specific business model type and operating context (innovation types and regions). According to the findings: Firstly, managers need to make strategic decisions regarding the innovation type and regions. Secondly, they should select the appropriate business model type, such as NMP, CR, or NPD. Lastly, the allocation of resources should be based on the business constructs, including capabilities, resources, and activities, along with associated indicators (e.g., marketing and strategy capabilities for NMPBM in the context of radical innovation). By following these steps, companies can effectively design and innovate their business models to drive success. This approach provides strategic guidance for companies to enhance their product innovation performance through business model innovative utilization and deployment of necessary assets. The results shed light on how companies strategically leverage their activities within the business

model to gain a competitive advantage. (Zott and Amit, 2010, N.Foss, 2017). As reported by the literature and research findings, a framework (Figure 8.18) has been developed to structure and innovate the business model for innovation performance. Building upon the work of Chesbrough and Rosenbloom (2002), this framework incorporates technical input and output, with the business model serving as a mediator for innovation and its performance outcomes. The developed framework demonstrates an architecture that accommodates different business model types and their corresponding components explored in this study. Importantly, the framework provides managers with a sequential approach to effectively innovate their business models and drive improved innovation performance.

In the integrated business model (BM) framework (Figure 8.18), the flow of business model innovation (BMI) begins from the left side with technical input (radical and incremental innovation options), followed by the middle section representing the BM configuration, which aligns with the literature BMI framework and research findings. It encompasses different BM types and elements for the sequential implementation of BMI, ultimately generating technology innovation performance as an output (on the right side).

By adopting this BM framework, Figures 8.19, 8.20, and 8.21 demonstrate the research findings regarding how the choice of innovation (technical input) mediated by different business models generates various innovation performance outcomes. These findings illustrate the implementation and innovation of business models in different contexts by elucidating the interactions between business model themes and the corresponding components that form the specific configuration. In these three models, the red boxes and indicator lines represent the configuration and outcomes of radical innovation business models, while the blue dotted boxes and indicator lines represent the configuration and outcomes of incremental innovation business models.

Figure 8.18 The business model implementation and innovation framework



Source: By adopting the business model framework of Chesbrough and Rosenbloom (2002) and the innovation types of Foss and Saebi (2016)

Figure 8.19 The business model (New market penetration) implementation

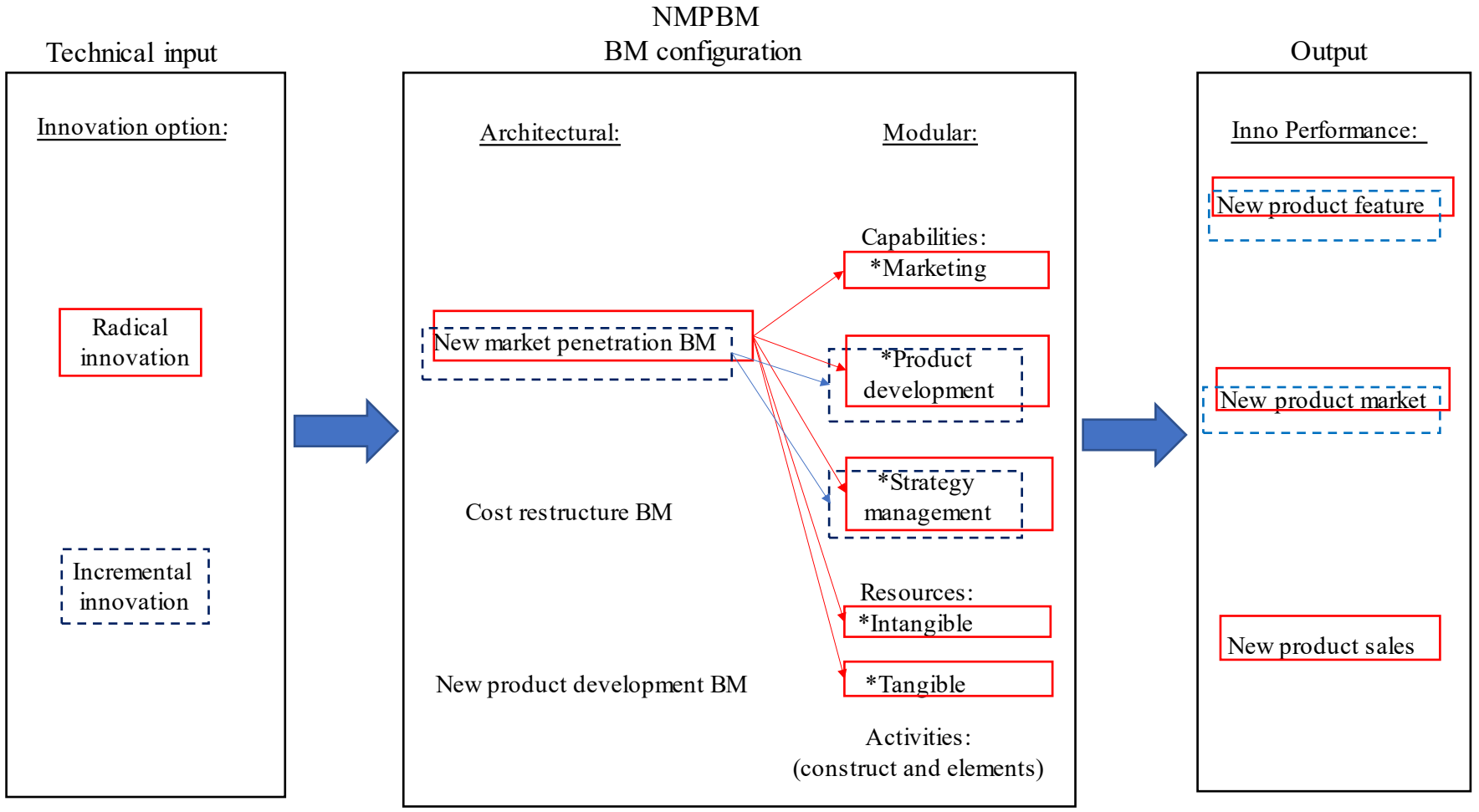


Figure 8.20 The business model (Cost Restructure) implementation

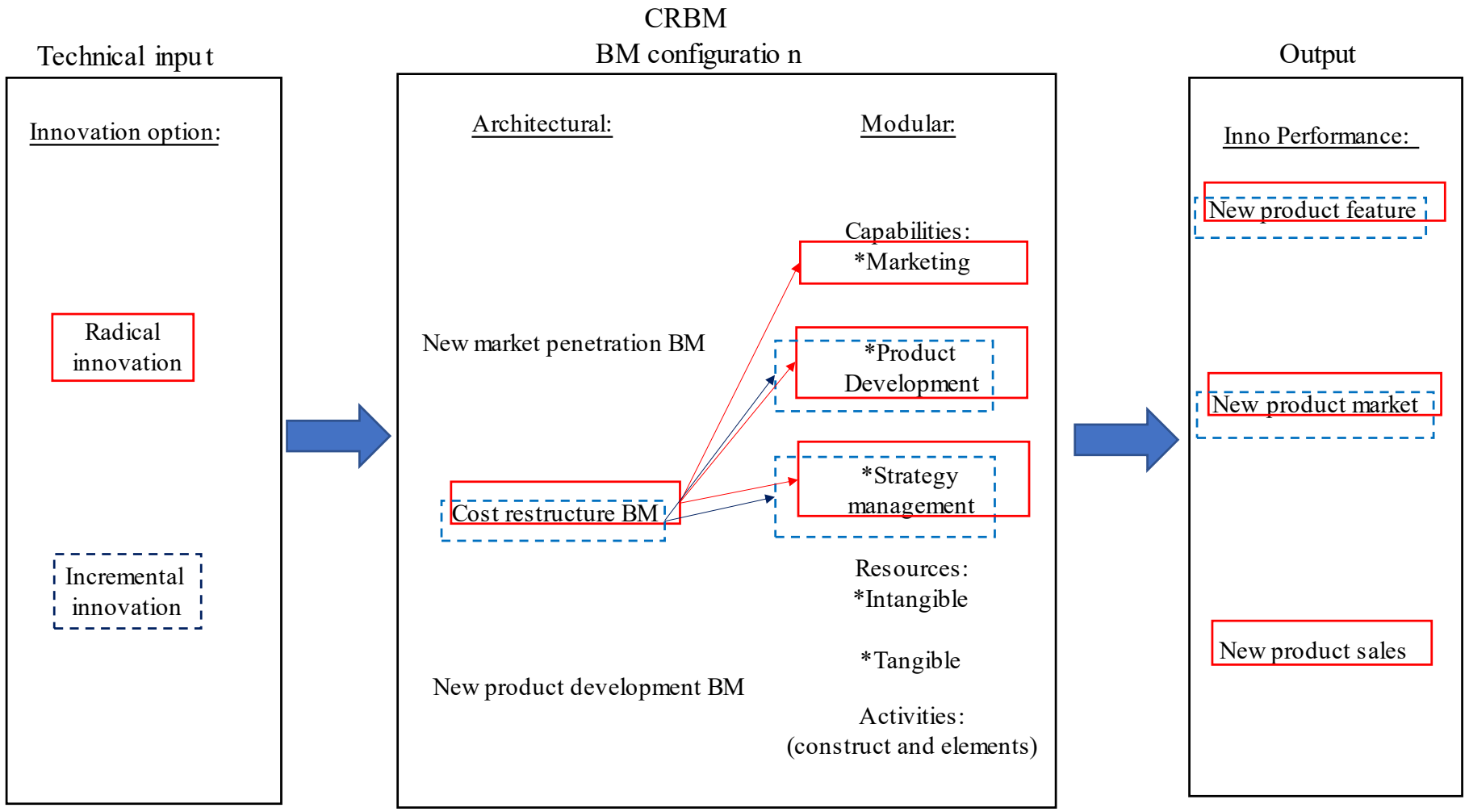


Figure 8.21 The business model (New Product development) implementation

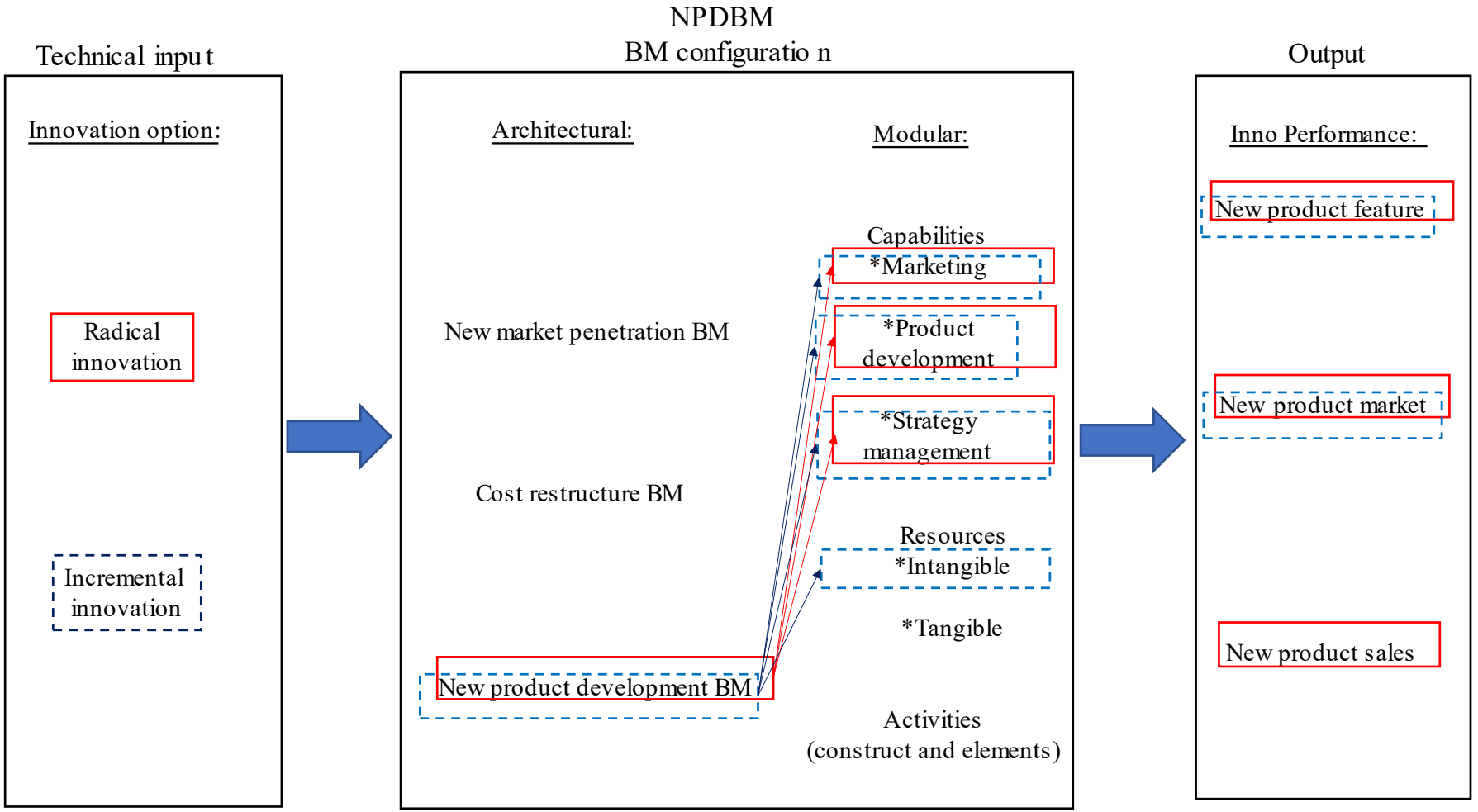


Figure 8.22 The business model configuration comparison in UK and TW

BM Types	UK					TW				
	Components	**Innovation Performance**	**OC->BM**	**OC->OS**	**BM->OS**	**Components**	**Innovation Performance**	**OC->BM**	**OC->OS**	**BM->OS**
NMPBM	Marketing capabilities	New Pdct feature	Supt	Supt	Supt		New Pdct feature	Supt	Supt	Supt
	Product capabilities	New Pdct market	Supt	Supt	Supt	Product capabilities	New Pdct market	Supt	Supt	Supt
	Strategy capabilities	New Pdct sales	Supt	Supt	Supt	Strategy capabilities		Supt	Supt	Supt
CRBM	Marketing capabilities	New Pdct feature	Supt	Supt	Supt	Marketing capabilities	New Pdct feature	Supt	Supt	Supt
	Product capabilities	New Pdct market	Supt	Supt	Supt	Product capabilities	New Pdct market	Supt	Supt	Supt
	Strategy capabilities	New Pdct sales	Supt	Supt	Supt	Strategy capabilities	New Pdct sales	Supt	Supt	Supt
NPDBM	Marketing capabilities	New Pdct feature	Supt	Supt	Supt		New Pdct feature	Significant	Significant	
	Product capabilities	New Pdct market	Supt	Supt	Supt		New Pdct market	Significant	Significant	
	Strategy capabilities	New Pdct sales	Supt	Supt	Supt			Significant	Significant	
						Tangible resources				

By comparing figure 8.20, 8.21 and 8.22, four observations emerged:

1. Under the employment of the identical BM, different technical input (radical or incremental innovation) will cause different BM configuration and generated various outcomes.
2. Different business models/configurations, despite pursuing different objectives, can share common component sets with each other. This means that certain elements or components may be applicable across multiple business models, regardless of their specific focus or goals.
3. These configurations are constituted in certain way to construct the architecture running as a systematic mechanism.
4. The innovation can be drawn in the configuration of a series of key decisions and/or a particular element(s).

By employing the framework, the three-business model's configuration and their interactions between organisational culture, structure and business model between UK and TW were presented in figure 8.22, The most significant observation emerged in the following two points. NMPBM and NPDBM contain various components and generate different innovation performance in UK and TW. NPDBM has significant impact on the organisational structure in UK but not in TW.

The result of the statistical finding highlights that the innovation performance business model plays a crucial role not just as a mediator, but as an enabler. Chesbrough's concept proposed a framework that business model mediates the technology input and generate economic innovation performance (Chesbrough and Rosenbloom, 2002). However, our statistical findings expand this discussion. The statistical comparison shows how different setups of business model elements impact innovation performance. In the framework (figure 8.18), business model innovation starts with technical input options for radical and incremental innovation. The business model configuration then follows, incorporating different types and elements to facilitate innovation performance. Ultimately, the results reveal that different business model types and their components can lead to varying innovation performance outcomes. These findings underscore the importance of the business model in driving innovation across diverse contexts. The statistical analysis in this study confirms that the business model serves as an enabler, shaping innovation outcomes through its capability, resource and activity employment and deployment.

The above observation is important because: Firstly, it highlights the significance of considering the cultural and contextual factors when analyzing the relationship between BMI and product innovation performance. The varying effects in different countries suggest that the

effectiveness of certain business model configurations may be influenced by the cultural and structural differences within each context. Furthermore, this finding contributes to the understanding of the complex interplay between organizational culture, structure, and business model. It indicates that the relationship between these factors is not universally consistent and may vary across different contexts. Thirdly, the statistical result endorses the transformative role of the business model, moving beyond its traditional function as a mediator to become an enabler of generating various innovation performance.

In summary, the observation of different impacts of NMPBM and NPDBM on the organizational structure in the UK and TW highlights the importance of considering cultural and contextual factors, adapting business models to local environments, and understanding the complex interrelationships between organizational culture, structure, and business models.

8.8.6 Conclusion

The quantitative research findings support the theoretical proposition: business models' discrepancies are reflected in different configurations and the components that evolve in various innovation pursuits and business environments. First, the identification of the business model types and their affirmed components demonstrate the business model heterogeneities. Then, the group analysis demonstrates the discrepancy between business model configuration and the corresponding innovation performance supporting the academic argument that different business model generates various outcomes. Thirdly, the business model configuration will alter in different innovation pursuits and culture.
In summary, these findings not only reveal the business model's role in enhancing innovation performance but also offer valuable insights on how managers can implement and innovate the innovation performance business model to enable companies continuously capture value. The proposed BMI framework has the potential to provide a sustainable competitive advantage. The next and final chapter will discuss these research objectives, theoretical contributions, and managerial implications in detail.

Chapter Nine: Conclusion

This final chapter will emphasise the conclusions of this research from multiple aspects, starting with an examination of the links between the research findings and the research objectives. With the given evidence, the research hypotheses are supported to generate theoretical contributions. The contributions provide a reference for practitioners to employ the competent business model. The limitations of the current research will be outlined alongside the obstacles that occurred in this study, and the following recommendations for further research will be addressed. In closing, a new role of business model will be proposed to conclude this study.

9.1 Results and research objectives

Following an extensive review of the pertinent literature, this thesis has aimed to show how companies can best configure the factors impacting their ability to develop a sustainable competitive advantage to cope with the challenges the modern markets pose. To serve this aim, research objectives were set, and the extant literature has informed the development of research hypotheses, the testing of which has allowed to meet these objectives. The following table offers a summary of the outcome from testing these hypotheses, with the intention to help the reader fathom the discussion that follows in the next sections. Each of the following four sections will address the research objectives and the findings to allow for the academic and/or practical contributions to emerge.

	Theoretical perspectives	Objectives	Outcomes
1	Business model is configured in certain set of elements.	Identify the business model configuration.	Business model configuration and the incorporated elements for innovation performance is explored.
2	Different business models have different configurations and purposes	Investigate the heterogeneity of business models for innovation performance.	Three business model types for innovation performance are identified.
3	Business model innovation can help a firm to be constantly competitive in the market.	Explore the implications of business model configuration on sustainable competitive advantage.	Three characteristics of business model for innovation performance are explored for sustainable competitive advantage.
4	Organisational culture, structure have impact on business model.	Examine the impact of organisational culture and structure towards business model.	The interactions between organisational culture, structure and business model for innovation performance are identified.

9.1.1 Identify the business model architecture for innovation performance

To identify the business model architecture for innovation performance, the existing literature on business models (Johnson et al., 2008; Richardson, 2008; Zott and Amit, 2012; Sun and Liu, 2020) provided frameworks that guided further investigation. These studies emphasized the importance of a unique bundle of business model elements for enhancing a firm's competitive advantage in the target market.

This thesis fills the gap by creating a scale of business model elements derived from diverse capabilities, resources, and activities. This pioneering method enables the measurement of business model architecture and supports research on business model innovation. By identifying specific elements and their allocation in the business model, this study enhances our understanding of how different configurations influence innovation performance. The findings offer valuable insights for companies aiming to strategically design their business models. Moreover, the developed scale of business model elements lays the groundwork for future studies and practical applications, helping companies design successful business models for innovation.

9.1.2 Examining the Impact of Different Business Models on Innovation Performance

The second research objective was to explore how different business models impact innovation performance. While previous studies touched on business model configurations, they lacked comprehensive explanations about the differences in structure, components, and outcomes among various business models. This study addresses this gap by focusing on the specific configuration of business models for innovation performance.

Drawing from existing literature, this research builds on the perspective that different business models have unique configurations and purposes(Zott and Amit, 2010, Zott et al., 2011, Foss and Saebi, 2016, Davidson, 2014, Geissdoerfer et al., 2018, Chesbrough and Rosenbloom, 2002, Sun and Liu, 2020). To achieve this, the study examines business model elements and employs statistical analysis to identify and compare three specific business model configurations: New Market Penetration, Cost Restructuring, and New Product Development.

The findings clearly demonstrate the structural differences among these identified innovation performance business models. This not only contributes to existing literature by providing empirical evidence for the relationship between business models and their purposes but also offers managers a valuable roadmap for effectively using available resources to enhance their competitive advantage.

9.1.3 Business Model and sustainable competitive advantage

The third research objective focused on exploring the implications of business model configuration on sustainable competitive advantage. Business models evolve based on strategic objectives, and companies strategically choose their innovation type to gain competitive advantages (N.Foss, 2017, Teece, 2010a, Zott et al., 2011, Hervas-Oliver et al., 2019, Lindgren, 2018). While business model literature has discussed how innovation contributes to a firm's competitive advantage, it lacks a clear explanation of how business model innovation sustains this advantage.

Specifically, sustainable competitive advantage refers to a company's ability to maintain its market position and outperform its competitors over an extended period (N.Foss, 2017, Saebi et al., 2017, Kennedy et al., 2017). The configuration of a business model can significantly impact a company's ability to achieve sustainable competitive advantage through a firm's unique way of resources employment and deployment. By aligning their business models with their strategic objectives, companies can promote their innovation which can enable them to develop new products that meet market needs (N.Foss, 2017, Kuncoro and Suriani, 2018, Todeschini et al., 2017, Souto, 2015, Lanzolla and Markides, 2020, Cortimiglia et al., 2016, Lindgren, 2018). However, how can a business model enable a firm to remain competitive in the market? To answer this question, three business model types were examined to see if any inconsistencies emerged in the context of innovation types. When comparing these three models in the context of different innovative product development approaches (radical and incremental innovation), variations in their architecture and components were observed, resulting in different outcomes. This finding highlight that the adoption of a business model for different innovation pursuits reflects distinct business constructs with specific elements. These configurations demonstrate a pattern of interaction between exogenous and endogenous business model innovation, influencing technological innovation performance. (Prendeville et al., 2017, N.Foss, 2017, Schneider, 2019).

Furthermore, the study identified three key characteristics of a business model for innovation performance (compatibility, constant innovation and adaptability) that can essentially help firms to enhance their sustainable competitive advantage. These characteristics highlight how a business model for innovation performance can be innovated to enable a firm to adapt constantly adapt to dynamic market challenges and create its unique competitive advantage that is difficult for competitors to replicate.

The identification of these three key characteristics has important implications for both academic research and industry practice. From an academic perspective, this study contributes

to the existing literature on business models and innovation by providing a deeper understanding of the relationship between business model configuration, innovation type, and innovation performance. Stated differently, this finding sheds light on how business models can be optimized to enhance a firm's sustainable competitive advantage. From an industry perspective, the finding help firms, which seek to innovate and enhance their sustainable competitive advantage, create a resilient and adaptable framework that promotes innovation that can enable them to develop new products susceptible to meet evolving market needs. By innovating their business model, firms can differentiate themselves from their competitors and create a unique competitive advantage that is difficult to replicate, thereby increasing their long-term profitability and success.

9.1.4 Examine the impact of organisational culture and structure towards business model

The fourth research objective was set to examine the impact of organisational culture and structure towards business model for innovation performance. A comparison of the three business models (NMPBM, CRBN, and NPDBM) was conducted in the UK and Taiwan. By looking at the configuration and the outcomes, discrepancies were found in the three business models which indicated that the same business model could evolve differently in different cultures. Based on the research findings, 14 out of the 15 models share consistency in how the business models interact with organisational culture and structure, reflecting the initial hypothesis. However, there is an exception in the NPDBM/TW case that does not significantly influence organisational structure. The findings generating by the comparison of three business models (NMPBM, CRBN, and NPDBM) in the UK and Taiwan revealed discrepancies, indicating that the same business model can evolve differently in different cultures. The majority of models showed consistency in their interactions with organizational culture and structure, supporting the initial hypothesis. However, there was an exception in the NPDBM/TW case, suggesting that the proposed interaction pattern may not have the necessary generalisability (Leih et al., 2015a, Hu, 2014)

Summary:

The research findings provide strong support for answering the overarching research question: how does a business model contribute to a company's competitive advantage by facilitating innovation performance? The results shed light on the heterogeneity of business model configurations, both through comparisons between multiple business models and by examining the variations in a single business model operating in different contexts. Three distinct business models of innovation performance (NMPBM, CRBM, and NPDBM) were identified, each with its own unique configuration, content elements, and purpose. Importantly,

the associated components of these business models were found to vary in different circumstances.

9.2 Theoretical contributions

This thesis significantly contributes to the existing literature by answering the important question of how the business model of innovation performance can help firms capture value from their innovation and enhance their sustainable competitive advantage. The research findings provide evidence and explanations of the relationship between different business models and their innovation performance. The study highlights that the business model of innovation performance implies three specific characteristics: the simultaneous achievement of the business model's internal resources compatibility, the constant innovation of the business model, and the business model adaptability of the chosen technological innovation and operating culture. These key factors illustrate how the business model can evolve and stay dynamic for capturing value, and how organizational culture plays a significant role in the interaction between the business model and organizational structure.

The theoretical contributions of this research can provide a foundation for future research in this area and further our understanding of the relationship between business model configuration and value capture (Casadesus-Masanell and Zhu, 2013, Cristóbal Casanueva, 2013, Baden-Fuller and Haefliger, 2013). As mentioned in Chapter 2, the existing studies indicate that business model heterogeneity leads to various outcomes. However, the gap lies in *what business model(s) enable companies to capture the value of their developed innovation*. The research findings adequately answer this question by providing evidence and explanations for the addressed argument: *Different business models contain different elements to form their configuration and lead to different performance of developed innovations* (Casadesus-Masanell and Ricart, 2010, Casadesus-Masanell and Zhu, 2013, Baden-Fuller and Haefliger, 2013). Meanwhile, based on the research results, the business model of innovation performance implies three specific characteristics: the simultaneous achievement of the business model internal resources compatibility, the constant innovation of the business model, and the business model adaptability of the chosen technological innovation and operating culture. These three key factors cause the business model discrepancy and illustrate how the business model can evolved and stay dynamic for capturing value.

Moreover, this study shows that the impact of organisational culture is not only on the business model configuration but is also on the interaction between the business model and the organisational structure. The theoretical contributions are described below:

R.O.1: Provides a comprehensive understanding of the elements that make up the business model configuration for innovation performance.

By conducting a thorough review of existing literature and developing a hypothesis, the researcher has successfully identified 43 variables associated with 171 items that can be used to measure the business model architecture. This approach can be used to complement the current research body of the relationship between business model configuration and value capture. Moreover, this finding will enable future researchers to compare the heterogeneity of business models for innovation performance and for practical application, and help companies design their business model. Overall, this thesis unfolds the configuration of the business model for innovation performance.

R.O.2: Explore the business models of innovation performance and their relevant elements:

The presented study contributes to the literature by introducing a framework of business model implementation and innovation that is based on the correlation between business model configuration and the adopted innovation type. This framework is informed by an analysis of the heterogeneity of business models and the associated components. The study introduces three business models: Newmarket penetration, Cost restructure, and New product development, which shape the framework of business model implementation and innovation. By emphasizing the importance of business model configuration, the study shifts the discussion of business model innovation from the impact of individual element variation to the logic of business model configuration, which is intertwined with the business model theme. This contribution is significant because it presents the concept of business model architectures with an unequivocal structure that presents the configuration of the business model. The study builds on theoretical sources by highlighting the importance of business model configuration in the context of innovation, and by emphasizing the need for a structured approach to business model innovation. The study also contributes to the literature by introducing a framework that can be used to guide the implementation of business model innovation in practice.

For achieving the above purpose, this study develops the business model measuring scale as a measurable and applicable unit. This scale aims to extend the theoretical discussion from exploring the essence and purpose of the business model to identify the discrepancy of the business models affects innovation performance.

As a result, the revealed correlation helps us understand why companies adopt different business models to facilitate the performance of their chosen innovation. Furthermore, to the best of our knowledge, up until today no other research study has addressed the concept of heterogeneity simultaneously within business models and their links to innovation performance and value capture. These findings not only identify what business model facilitates the innovation performance, but open access to investigate the approaches of how

the business model impacts the value capture.

R.O.3: To reach the insight of how the business model affects sustainable competitive advantage.

The paragraph provides a contribution to the literature by developing an integrated business model (BM) framework that explains the generation of business model discrepancy and how it affects the transformation of technical innovation into innovation performance. The author argues that the implementation and innovation of a business model lie in a combination of key decisions that can be distinguished into two domains: external and internal innovation. The external innovation pertains to changes in the business model configuration in response to environmental changes (N.Foss, 2017, Zott and Amit, 2010, Zott et al., 2011), while the internal innovation focuses on innovating the business model components itself (N.Foss, 2017). The author contends that these two domains are intertwined to create an activities system that helps companies draw innovation to create sustainable competitive advantages.

The findings presented in this thesis demonstrate that the innovation performance business model operates as a mechanism that links associated components in a specific construct. Different sets of components indicate different types of operation leading to various innovation performances. This thesis also demonstrates that a company can evolve its business model by either changing the entire construct corresponding to the innovation type or improving specific components to keep the business model dynamic.

The author's contributions to theory can be summarized in three key aspects:

1. The compatibility of the exogenous business model type and the endogenous business model elements:

The business model consists of an external business focus and an internal configuration of business model elements, which work together to support the implementation and innovation of the business model.A strategy maker needs to be equipped with a holistic view to execute the business model by learning About exogenous BM design (deciding the business model theme to respond to the external changes) and endogenous BM design (employing and deploying the components associated with the chosen BM theme to conduct its implementation).

2. The constant innovation of the business model:

To evolve the business model, innovation can be drawn in changing the entire BM type and the associated components or keep the existing BM configuration but focus on innovating a specific articulation (e.g., product development). Either way aims to keep the business model dynamic and helps the company to create the sustainable competitive advantage.

3. The adaptability of the chosen innovation:

The research findings demonstrate that different business model incorporates different focus and configuration and will adjust when operating with different innovation. Employing the right business model to serve the chosen technological innovation determines if the business model implementation or innovation can transform the product into the intended performance.

The above three points depict the logic of how the business model can stay dynamic and why any single key decision of innovating or implementing business model might affect the whole business model activity system. Stated differently, the integrated BM framework and findings provide insight into the constitution and operation of the innovation performance business model. The three characteristics highlighted by the author - compatibility, constant innovation, and adaptability - offer a roadmap for designing and implementing a successful business model for innovation performance, ultimately helping companies enhance their sustainable competitive advantage.

R.O.4: Explores the impact of organisational culture on business model configuration and implementation.

This study contributes to the organizational literature by investigating the impacts and interactions of organizational culture and structure on business models (Zheng et al., 2010, Janicijevic, 2013, Wagner et al., 2014, Islam et al., 2015, Mao et al., 2016, Leih et al., 2015a, Achtenhagen et al., 2013). Specifically, this research aims to understand how organizational elements work with business models to facilitate innovation performance. By conducting research in different cultural contexts (UK and Taiwan), this study examines the role of regional culture towards business model configurations, as well as the flow of the impact from organizational culture and structure to business models. The research findings provide a significant contribution to the understanding of the cultural influence in cross-national studies. The results show that there is a similarity of the business model configuration between the cultures/regions and the innovation type, and inequality of the interaction between business models, organizational culture, and structure. These findings provide a basis for further studies on how regional culture affects a company's inclination towards innovative product types and the associated business model innovation and implementation. This research is imperative for

developing constructs to boost advanced studies by grounding the role of organization management towards the business model.

For example, the business model configuration of radical innovation is exactly the same with the UK sample in terms of CRBM and NPDBM. Meanwhile, by observing the configuration of NMPBM, its incremental innovation model's configuration is identical with the TW one. Moreover, the NPDBM/TW is the only model that does not significantly affect the organisational structure among the other 14. The completed checklist details the examination of the research hypothesis and endorses the fulfilment of the research gap. The similarity of the business model configuration between the cultures/regions and the innovation type, and the inequality of the interaction between business models, organisational culture and structure provide a base to study further how regional (east and west) culture affects a company's inclination of innovative product types and the associated business model innovation and implementation.

In summary, the above contributions are all centred on answering the essential research question: *what business model(s) enable companies to capture the value of their developed innovation*. In addition, one of the most prominent issues emerging from the research findings is the exploration of how the business model operates as a mechanism. Hence, the business model configuration has been materialised to identify the three business models for innovation performance and elaborate on how the models capture value. Specifically, the business model of innovation performance needs to stay dynamic by keeping itself dynamic under the conditions of resources compatibility, constantly evolving and the adaptability of the chosen technological innovation. Moreover, the impact of the culture is revealed in the business model constitution and the organisational structure. These finding not merely answer the research question by identifying the business model of innovation performance, but further explaining how the business model achieve the value capture**.**

9.3 Managerial implications

Apart from the theoretical contributions, the study's results reflect practical implications for industry managers and organisations. As mentioned, when a successful business model refers to the accumulation derived from a series of key decisions, the research findings present a roadmap elaborating on the architecture and configuration of various business models to show where to put the effort or invest in designing, innovating and implementing a business model, which aims to serve strategy makers in making key decisions efficiently and effectively. More importantly, the explored discrepancy between the three business models under different innovation pursuits and cultures (fifteen statistical models) explains the purpose of the business model heterogeneity and fulfil the research gap by introducing how the three business models proceed with value capture.

A. Presenting the roadmap of the business model administration:

In terms of industrial application, managers faced the challenge of *How do companies make their business model successful?* (Markides and Charitou, 2004, Markides, 2013, Zott and Amit, 2010, Zott and Amit, 2012, Baden-Fuller and Haefliger, 2013, N.Foss, 2017, Geissdoerfer et al., 2018).This research integrates the stream of business model design, innovation, and implementation by combining the notion of business model assortment and business model innovation with the implementation of a company's strategic choice. Differently put, the proposed framework (section 8.8) elaborates upon how BMI proceeds as the decision-making arena in a series of options to identify and explain the business model discrepancy. Specifically, the proposed framework reveals access to accommodate the business model type and its affiliated set of components by which the architectures of multiple business model types were presented.

The presented business models, corresponding to the innovation choice, depict the required assets to implement a competent business model. This information enables managers to invest in the outlined articulation for better deploying and employing their resources to facilitate their current or upcoming innovation performance. For example, in the case of Apple and HTC, two smartphone companies deliver similar products but adopt different business models to generate various outcomes (Zott and Amit, 2012). In Apple's case, they launched the hardware aligned with the iTunes software to provide a brand-new music-carrying package to the market. This radical innovation, combined with the New market penetration business model, enabled Apple to reach new customers who were not smartphone users. Moreover, its focus on employing and deploying the strategy capabilities enables Apple to engage customers with the iTunes service and iPhone constantly. Comparatively, the incremental improvement of the smartphone

itself did not bring significant product sales to HTC. In 2010, these two mobile manufacturers' stock prices started to go opposite from each other, and Apple has become the market leader ever since.

Hence, the business model roadmap presented in this study offers a valuable tool for managers to make strategic decisions about their business model. The framework enables managers to identify and explain discrepancies in their current business model, and to select the most appropriate business model based on their innovation goals. This approach provides a clear understanding of the required assets and components necessary to implement a successful business model, which can help managers invest their resources more effectively and improve their company's competitive advantage (Julienti Abu Bakar and Ahmad, 2010, Ghapanchi et al., 2014, N.Foss, 2017).

In essence, the roadmap provides precise articulations of the necessary steps to be taken when constructing a business model for innovation and enables managers to make informed decisions at each stage of the process. By utilizing the framework, managers can identify and focus on the critical components of their business model, and allocate resources more efficiently, leading to improved performance outcomes. Furthermore, the presented business models correspond to different innovation choices and offer managers a range of options for implementation. For example, the Newmarket penetration business model may be appropriate for a company seeking to reach new customers, while the Cost restructure model may be suitable for a company seeking to optimize their existing operations. By offering a range of options, the framework enables managers to select the most appropriate business model based on their unique circumstances and innovation goals.

In summary, the provided business model roadmap is a valuable contribution to the field of business strategy. By integrating business model design, innovation, and implementation, the framework enables managers to construct a business model for innovation that aligns with their goals, invest resources effectively, and enhance their company's competitive advantage.

B. Assessing the cost of the business model innovation or transformation:

This study also provides valuable insights for managers who are considering business model innovation or transformation (Foss and Saebi, 2016, Geissdoerfer et al., 2018, Lindgren, 2018). The study highlights the importance of assessing the potential costs of such transformations before taking action. By comparing different types of business model configurations, managers can analyse the cost of acquiring, allocating, and/or innovating the business model elements through the outlined business model construct and configuration. This enables managers to

determine the necessity and management cost of business model transformation and make informed decisions about the best course of action.

Furthermore, the study reveals that the business model construct can vary depending on the local business culture. Therefore, managers need to consider cultural factors when developing and implementing business models. Additionally, while the organizational structure is not directly affected by the business model, it can still impact the organizational culture. This means that the interaction between business models, organizational structure, and local culture can vary, and managers need to consider adjustments due to these interactions when determining the level of business model formation and implementation.

To sum up, how can a manager adopt, develop, and rely on a specific business model? The proposed three business models and their framework outlined the list of the needed assets corresponding to strategic decisions (innovation types) and shows the linkage of articulations of business model. With this information, managers can invest resources effectively and efficiently while attempting to capture the value of their developed innovation. Moreover, how organisation culture affects business model would also be imperative for the company to perform better. In short, this research contributes to industrial practice by helping strategy makers to manage the dynamic nature of the adopted business model in serving their developed technological innovation to better reach its intended performance.

9.4 Limitations

Although the presented study provides information to answer the research questions, limitations still exist and should be considered when drawing any conclusions. These limitations are related to the research methodology, population, and scale in terms of size, transaction type , sector, country and time factors.

Firstly, the presented study collected data from 248 companies across two regions (UK: 109, TW: 119) through reputable research institutes (Qualtrics and CRIF) due to difficulties in reaching companies' strategy makers. While the collected data falls within the same range as similar studies, a more prominent data size could have provided stronger reliability and validity to enable the research results to have stronger representativeness and generalizability. However, given the financial and time limitations, further expansion of the data scale was not possible. Still, while a larger sample size could have been beneficial, the current sample size was appropriate given the limitations mentioned above.

Secondly, this study specifically examines 10 high-tech industries (as listed in Chapter Four) to isolate the impact of industry context on our investigation. While this approach ensures more precise results, it also limits the applicability of our findings. It is worth noting that innovation is not limited to just technology, but it can also be found in a variety of industries such as food/beverages, travel, retail, and services. Additionally, there may be new and varied business models that arise in industries that have not been studied yet. Future researchers could consider expanding the scope of the study to include these industries and their potential for innovation.

Finally, with regards to country-specific limitations, the participating companies are only based in the UK and Taiwan. The research findings demonstrate variances in the country group analysis, underpinning the assumption that the replication of the study in other countries (business environment) might lead to different results of different business model type and its configuration. Such as, based on Hofstede's cultural dimensions framework, several cultural contexts can be considered for studying cultural similarities and differences in relation to the findings mentioned above. Each cultural dimension represents a specific element or aspect of culture that can potentially have an effect on the business model types and their configurations. For instance, it would also be worth exploring other cultural contexts that may affect the findings being reported. For instance, researchers could study the impact of Confucianism on business practices in East Asian countries, or the role of collectivism vs. individualism in business decision-making processes in various cultures. These cultural factors may have an effect on the adoption and success of certain business models

Apart then that, economic development conditions could also be the context for the future research. While the research findings from the UK and Taiwan demonstrate variances in the country group analysis, it is important to consider the economic differences in other country (ex. Nigeria) when generalizing these findings. Additional research would be necessary to determine the applicability of the study's findings to other regions with different economic conditions.

To address these limitations, future researchers could expand the sample size and include companies from multiple industries and countries to increase the research's generalizability. Additionally, researchers could examine other factors, such as cultural and social contexts, that may influence business model innovation and transformation. Overall, while the current study provides a valuable framework for business model innovation, further research is necessary to explore this topic fully.

Overall, this study aimed to develop a practical framework to help managers to implement effective business models for innovation performance, and to explore how such models contribute to sustainable competitive advantage. The study presented multiple business model architectures that supported the research hypothesis of business model variance. However, the limitations discussed earlier, such as the sample size and focus on high-tech industries, restrict the generalizability of the study's findings. Therefore, further research is needed to explore the applicability of this framework in different contexts and industries to enhance the validity and reliability of the results. Despite these limitations, this study provides a valuable contribution to the literature on business model innovation and opens opportunities for future research.

9.5 Suggestions for future research

By looking at the current study results and the limitations mentioned earlier, a range of research opportunities are revealed for future research. The suggestions concern employing the newly developed measurement scale to explore advanced business model configurations associated with different performance studies or applying the current framework in various contexts to observe any variances.

As the present measurement scale of the business model and its relevant components is a newly developed one, the explored structure can be employed in other types of research to learn more about the impact of business models on various sectors (e.g., different performance and industries). This line of study will offer the possibility to explore additional business model assortments, components or even new interactions between the constructs to explore the concealed business model frameworks that operate as the various approaches for multiple pursuits. Furthermore, the new business model framework can be compared with existing ones to investigate generalisability among different purposes.

Additionally, since the current research project aimed to investigate the heterogeneity and homogeneity) within business model configurations to enhance a firm sustainable competitive, the present business model framework can be conducted in different regions and with innovation types to extend the range to a more comprehensive investigation of business model heterogeneity. In this vein, the explored variances can be viewed as the determinants to endorse the business model's dynamic nature but conjointly generate the expected outcomes in various contexts.

Furthermore, the three introduced business model assortments, new market penetration, cost restructure, and new product development, can be adopted for longitudinal research to reveal the outcomes of employing multiple business models, simultaneously or sequentially, to build a company's sustainable competitive advantage.

9.6 Conclusion

The research findings provide a comprehensive view and the relevant knowledge to answer the research question: what business model (or models) contributes to value capture. By investigating the relationship between the configuration of the business model and value capture. The specific configuration of the business model plays a crucial role in influencing a firm's ability to capture value from the technological innovation. These results help us to understand how business model can be different from others and extend the theoretical discussion to how a company can constantly perform differently than others by transforming the technology innovation into different outcomes.

These findings aim to help academics and managers reach insight into how a business model works as a conglomeration. The importance of the business model's internal element compatibility, constant innovation and the adaptability of external technology innovation has been highlighted as the essence of a successful BM. Meanwhile, the outlined business model configuration can help strategy makers to conduct the decision making in a holistic vision with efficiency and effectiveness. The five points outlined below identify the business model heterogeneity and explain how the discrepancy generates various outcomes.

1. The heterogeneity of business models emerged not in a single or several business model components; BM innovating and implementing must be relevant to the interactions between components and articulations and how these interactions change in different contexts.
2. The interactions emerging within the business model architecture determine how the business model construct its specific architecture and works in a particular way, enabling the business model to generate outcomes relevant to a definite pursuit instead of a universal one.
3. The explored business model framework reveals the options and components that elaborate upon how the business model should be configured to implement the strategic decision to acquire the intended innovation performance.
4. The business model should be dynamic and adaptable, allowing for both exogenous and endogenous innovation and maintaining a seamless connection between them.
5. The impact of a business model on organisational structure is not equally significant in different regions.

In conclusion, the research findings highlight how the proposed business model architecture empowers managers to continuously innovate their business models, thus driving technological innovation performance. The proposed framework not only addresses the

research objectives by assisting strategic decision-makers in capturing value from their products. Furthermore, the sequential structure of key decision-making elucidates the link between business model innovation and sustainable competitive advantage. To answer the research question, the exploration and the examination of the business model heterogeneity elaborate the configuration of the three business models of innovation performance: New market penetration, Cost restructure, and New product development, and explain how multiple innovation performances are generated. In addition, the three explored characteristics of the successful business model (Compatibility, Innovation, and Adaptability) validate the approaches and necessity of the business model dynamic. Moreover, the impact of organisational culture on the business model constitution and innovation is verified. Therefore, when the previous literature considers the business model the mediator between technological input and economic output, this research identifies what business models and explains how these business models can be enablers in transforming technological innovation into a company's sustainable competitive advantage. These findings serve the strategy makers to justify whether their investment CAN or CANNOT construct, evolve, and transform their business models to capture the value of their developed innovation.

References

ABANIS TURYAHEBWA, A. S. A. D. S. 2013. Financial management practices and business performance of small and medium enterprises in western Uganda. African Journal of Business Management Vol. 7(38), pp. 3875-3885, 14 October, 201.

AB HAMID, M. R., SAMI, W. & MOHMAD SIDEK, M. H. 2017. Discriminant Validity Assessment: Use of Fornell & Larcker criterion versus HTMT Criterion. Journal of Physics: Conference Series, 890, 012163.

ABANIS TURYAHEBWA, A. S. A. D. S. 2013. Financial management practices and business performance of small and medium enterprises in western Uganda. African Journal of Business Management Vol. 7(38), pp. 3875-3885, 14 October, 201.

ACHTENHAGEN, L., MELIN, L. & NALDI, L. 2013. Dynamics of Business Models – Strategizing, Critical Capabilities and Activities for Sustained Value Creation. Long Range Planning, 46, 427-442.

ACKERMANN, M. S., STEPHAN, M. & PENROSE, J. M. 2015. Assessing organizational innovativeness – evidence from corporate narratives. Corporate communications, 20, 399-414.

ADAM, M. 2016. Creating Market Orientation and Business Culture to Increase SMEs Performance in Aceh, Indonesia. DLSU Business & Economics Review, 26, 81-92.

ADAMS, G. A. S., J. 1991. Understanding research method (2nd edition) New york; Longman.

AFUAH, A. 2004. Business models: A strategic management approach. McGraw-Hill Companies, Incorporated.

AFUAH, A. & TUCCI, C. 2001. Internet Business Models and Strategies-Text and Cases.

ALEGRE, J. & CHIVA, R. 2008. Assessing the impact of organizational learning capability on product innovation performance: An empirical test. Technovation, 28, 315-326.

AMABILE, T. 1988. A model of creativity and innovation in organizations. Research in organizational behavior, 1988.

AMIT, R. & ZOTT, C. 2001. Value creation in E-business. Strategic Management Journal, 22, 493-520.

AMIT, R. & ZOTT, C. 2002. Value drivers of e-commerce business models.

AMIT, R. & ZOTT, C. 2015. Crafting Business Architecture: the Antecedents of Business Model Design. Strategic Entrepreneurship Journal, 9, 331-350.

ANDERSON, J. C. & GERBING, D. W. 1988. Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. Psychological bulletin, 103, 411-423.

ARNOLD, T. J., FANG, E. & PALMATIER, R. W. 2010. The effects of customer acquisition and retention orientations on a firm's radical and incremental innovation performance. Journal of the Academy of Marketing Science, 39, 234-251.

ASLANI, A. & MOHAGHAR, A. 2013. Business structure in renewable energy industry: Key

areas. Renewable and Sustainable Energy Reviews, 27, 569-575.
ATUAHENE-GIMA, K. 1996. Market orientation and innovation. Journal of Business Research, 35, 93-103.
ATUAHENE-GIMA, K. & KO, A. 2001. An Empirical Investigation of the Effect of Market Orientation and Entrepreneurship Orientation Alignment on Product Innovation. Organization Science, 12, 54-74.
ATUAHENE-GIMA, K. & MURRAY, J. Y. 2004. Antecedents and Outcomes of Marketing Strategy Comprehensiveness. Journal of marketing, 68, 33-46.
ATUAHENE-GIMA, K., SLATER, S. F. & OLSON, E. M. 2005. The Contingent Value of Responsive and Proactive Market Orientations for New Product Program Performance. The Journal of product innovation management, 22, 464-482.
BABAKUS, E. & MANGOLD, W. G. 1992. Adapting the SERVQUAL scale to hospital services: An empirical investigation. Health Serv Res, 26, 767-786.
BADEN-FULLER, C. & HAEFLIGER, S. 2013. Business Models and Technological Innovation. Long Range Planning, 46, 419-426.
BADEN-FULLER, C. & MORGAN, M. S. 2010. Business Models as Models. Long Range Planning, 43, 156-171.
BARNEY, J. 1991. Firm Resources and Sustained Competitive Advantage. Journal of Management, 17, 99-120.
BARNEY, J. 2001a. Is the resource based view a useful perspective for strategical management? Yes. Academy of management review.
BARNEY, J. B. 1986. Organizational culture: Can it be a source of sustained advantage? Academy of Management Review, 11, 656.
BARNEY, J. B. 2001b. Resource-based theories of competitive advantage: A ten-year retrospective on the resource-based view. Journal of Management, 27, 643-650.
BASU, R. & GREEN, S. G. 1997. Leader-Member Exchange and Transformational Leadership: An Empirical Examination of Innovative Behaviors in Leader-Member Dyads. Journal of applied social psychology, 27, 477-499.
BATOCCHIO, A., MINATOGAWA, V. L. F. & ANHOLON, R. 2017. Proposal for a method for business model performance assessment: Toward an experimentation tool for business model innovation. Journal of Technology Management and Innovation, 12, 61-70.
BECKMANN, C. F., JENKINSON, M. & SMITH, S. M. 2003. General multilevel linear modeling for group analysis in FMRI. NeuroImage, 20, 1052-1063.
BENGTSSON, L. 2018. The Role of Business Model Innovation. Centre for Innovation, Research and Competence in the Learning Economy (CIRCLE),Lund University, PO Box 117, 221 00 Lund, Sweden.
BLOCKER, C., FLINT, D., MYERS, M. & SLATER, S. 2011. Proactive customer orientation

and its role for creating customer value in global markets. J. of the Acad. Mark. Sci., 39, 216-233.

BODLAJ, M. 2010. The impact of a responsive and proactive market orientation on innovation and business performance. Economic and Business Review, 12, 241-261.

BODLAJ, M., COENDERS, G. & ZABKAR, V. 2012. Responsive and proactive market orientation and innovation success under market and technological turbulence. Journal of Business Economics and Management, 13, 666.

BOYCE, A. S., NIEMINEN, L. R. G., GILLESPIE, M. A., RYAN, A. M. & DENISON, D. R. 2015. Which comes first, organizational culture or performance? A longitudinal study of causal priority with automobile dealerships. Journal of Organizational Behavior, 36, 339-359.

BRYMAN, A. 2006. Editor's introduction: mixed methods research', . Mixed methods; valume 1. London; Sage, pp. XXV-LII.BUCHERER, E., EISERT, U. & GASSMANN, O. 2012. Towards Systematic Business Model Innovation: Lessons from Product Innovation Management. Creativity and Innovation Management, 21, 183-198.

BUTLIN, M., & CARNEGIE, R. 2001. Developing innovation in a medium business: A practical approach. Innovation and imagination at work (pp. 107–131). Sydney: McGraw-Hill.

CAMERON, K. S. & QUINN, R. E. 1999. Diagnosing and changing organizational culture : based on the competing values framework, Reading, Mass., Reading, Mass. : Addison-Wesley.

CASADESUS-MASANELL, R. & RICART, J. E. 2010. From Strategy to Business Models and onto Tactics. Long Range Planning, 43, 195-215.

CASADESUS-MASANELL, R. & ZHU, F. 2013. Business model innovation and competitive imitation: The case of sponsor-based business models. Strategic Management Journal, 34, 464-482.

CHAN HUNG NGAI, J. & ELLIS, P. 1998. Market orientation and business performance: some evidence from Hong Kong. International Marketing Review, 15, 119-139.

CHEN, I. S. N. & FUNG, P. K. O. 2013. Relationship configurations in the apparel supply chain. Journal of Business & Industrial Marketing, 28, 303-316.

CHEN, Z., HUANG, S., LIU, C., MIN, M. & ZHOU, L. 2018. Fit between Organizational Culture and Innovation Strategy: Implications for Innovation Performance. Sustainability, 10, 3378.

CHESBROUGH, H. 2004. The sustainability of technology markets.

CHESBROUGH, H. 2007. Business model innovation: it's not just about technology anymore. Strategy & Leadership, 35, 12-17.

CHESBROUGH, H. 2010. Business Model Innovation: Opportunities and Barriers. Long Range Planning, 43, 354-363.

CHESBROUGH, H. 2020. To recover faster from Covid-19, open up: Managerial implications from an open innovation perspective. IND MARKET MANAG, 88, 410-413.

CHESBROUGH, H. & ROSENBLOOM, R. 2002. The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies. Industrial and Corporate Change, 11.

CHIRICO, F. & NORDQVIST, M. 2010. Dynamic capabilities and trans-generational value creation in family firms: The role of organizational culture. International Small Business Journal: Researching Entrepreneurship, 28, 487-504.

CHRISTENSEN, C. M. 1997. The innovator's dilemma: when new technologies cause great firms to fail, Boston, Mass., Boston, Mass.: Harvard Business School Press.

CHRISTENSEN, C. M. 2001. The Past and Future of Competitive Advantage. MIT Sloan Management Review, Wntr, 2001, Vol.42(2), p.22

CHRISTENSEN, C. M., BARTMAN, T. & VAN BEVER, D. 2016. The hard truth about business model innovation. MIT Sloan management review, 58, 31.

CHRISTENSEN, C. M., MCDONALD, R., ALTMAN, E. J. & PALMER, J. E. 2018. Disruptive Innovation: An Intellectual History and Directions for Future Research. Journal of Management Studies, 55, 1043-1078.

CLARK, A. M. 1998. The qualitative-quantitative debate: moving from positivism and confrontation to post-positivism and reconciliation. Journal of Advanced Nursing, 1998,27, 1242-1249.

CLAUSS, T. 2016. Measuring business model innovation: conceptualization, scale development, and proof of performance.

CLAUSS, T. 2017. Measuring business model innovation: conceptualization, scale development, and proof of performance. R&D Management, 47, 385-403.

COLLINS, C. J. & SMITH, K. G. 2006. KNOWLEDGE EXCHANGE AND COMBINATION: THE ROLE OF HUMAN RESOURCE PRACTICES IN THE PERFORMANCE OF HIGH-TECHNOLOGY FIRMS. Academy of Management journal, 49, 544-560.

CORTIMIGLIA, M. N., GHEZZI, A. & FRANK, A. G. 2016. Business model innovation and strategy making nexus: evidence from a cross-industry mixed-methods study. R&D Management, 46, 414-432.

CRISTJOS¢ L. GALñN 2013. Informational networks and innovation in mature industrial clusters. Journal of Business Research 66 (2013) 603–613.

CROTTY, M. 1998. The foundations of social research: meaning and perspective in the research process, London, London: Sage Publications.

DAFT, R. 1978. A dual-core model of organizational innovation. Academy of Management Journal (pre-1986), 21, 193.

DAHLGAARD, J. J., KRISTENSEN, K., KANJI, G. K., JUHL, H. J. & SOHAL, A. S. 1998.

Quality management practices: a comparative study between East and West. The International journal of quality & reliability management, 15, 812-826.

DAMANPOUR, F. & ARAVIND, D. 2012. Organizational Structure and Innovation Revisited. 483-513.

DAMANPOUR, F. & GOPALAKRISHNAN, S. 1998. Theories of organizational structure and innovation adoption: the role of environmental change. Journal of Engineering and Technology Management, 15, 1-24.

DAMANPOUR, F. & GOPALAKRISHNAN, S. 2001. The Dynamics of the Adoption of Product and Process Innovations in Organizations. Journal of management studies, 38, 45-65.

DANUPOL HOONSOPON, G. R. 2012. The Impact of Organizational Capabilities on the Development of Radical and Incremental Product Innovation and Product Innovation Performance. JOURNAL OF MANAGERIAL ISSUES Vol. XXIV Number 3 Fall 2012: 250-276.

DASILVA, C. 2018. Enduring Entrepreneurship: The Process of Business Model Innovation.

DAUGHERTY, P. J., CHEN, H. & FERRIN, B. G. 2011. Organizational structure and logistics service innovation. The International Journal of Logistics Management, 22, 26-51.

DAVCIK, N. S. & SHARMA, P. 2016. Marketing resources, performance, and competitive advantage: A review and future research directions. Journal of Business Research, 69, 5547-5552.

DAWES, J. 2008. Do data characteristics change according to the number of scale points used? An experiment using 5-point, 7-point and 10-point scales. International journal of market research, 50, 61-77.

DAY, G. 1994. The Capabilities of Market-Driven organizations. Journal of Marketing, Oct 1, 1994, Vol.58(4), p.37.

DE JONG, J. P. J. & DEN HARTOG, D. N. 2007. How leaders influence employees' innovative behaviour. European journal of innovation management, 10, 41-64.

DEKOULOU, P. & TRIVELLAS, P. 2017. Organizational structure, innovation performance and customer relationship value in the Greek advertising and media industry. Journal of Business & Industrial Marketing, 32, 385-397.

DEMIL, B. & LECOCQ, X. 2010. Business Model Evolution: In Search of Dynamic Consistency. Long Range Planning, 43, 227-246.

DESARBO, W. S., ANTHONY DI BENEDETTO, C., MICHAEL, S. & SINHA, I. 2005. Revisiting the Miles and Snow strategic framework: uncovering interrelationships between strategic types, capabilities, environmental uncertainty, and firm performance. Strategic Management Journal, 26, 47-74.

DESHPAND¢, R. & FARLEY, J. U. 2004. Organizational culture, market orientation, innovativeness, and firm performance: an international research odyssey. International

Journal of Research in Marketing, 21, 3-22.
DESHPANDE, R. 1983. "Paradigms Lost": On Theory and Method in Research in Marketing. Journal of Marketing.
DIACOUN., M. 2014. FROM THE ORIENTATION OF MARKETING TO BUSINESS MODEL – A MORE ENTREPRENEURIAL UNIVERSITY.
DOGANOVA, L. & EYQUEM-RENAULT, M. 2009. What do business models do?: Innovation devices in technology entrepreneurship. Research Policy, 38, 1559-1570.
DP LEPAK, K. S. 2007. Value creation and value capture: a multilevel perspective. Academy of Management Review Vol. 32, No. 1.
EASTERBY-SMITH, M., THORPE, R., JACKSON, P., AND LOWE, A. 2008. Management Research (erd edn). London: sage.
EROSA, V. E. 2012. Dealing with Cultural Issues in the Triple Helix Model Implementation: A Comparison Among Government, University and Business Culture. Procedia - Social and Behavioral Sciences, 52, 25-34.
FELDMAN, S. P. 1988. How organizational culture can affect innovation. Organizational Dynamics, 17, 57-68.
FIELD, A. P. 2018. Discovering statistics using IBM SPSS statistics, London Thousand Oaks, California: SAGE Publications.
FIOL, C. M. 1991. Managing Culture as a Competitive Resource: An Identity-Based View of Sustainable Competitive Advantage. Journal of Management, 17, 191-211.
FODDY, W. H. 1994. Constructing questions for interviews and questionnaires: theory and practice in social research, Cambridge, UK. New York, NY, USA: Cambridge University Press.
FOR¢S, B. & CAMIS Journal of Business Research, 69, 831-848.
FOSS, N. J. & SAEBI, T. 2016. Fifteen Years of Research on Business Model Innovation: How Far Have We Come, and Where Should We Go? Journal of Management, 43, 200-227.
FRAN÷A, C. L., BROMAN, G., ROBøRT, K.-H., BASILE, G. & TRYGG, L. 2017. An approach to business model innovation and design for strategic sustainable development. Journal of Cleaner Production, 140, 155-166.
FREEMAN, C. 1982. The economics of industrial innovation, London, London: Pinter.
FREEMAN. JOHN, E. J. S. 2007. Models of Innovation: Startups and Mature Corporations. CALIFORNIA MANAGEMENT REVIEW VOL. 50, NO. 1 FALL 2007.
GAMBARDELLA, A. & MCGAHAN, A. M. 2010. Business-Model Innovation: General Purpose Technologies and their Implications for Industry Structure. Long Range Planning, 43, 262-271.
GEISSDOERFER, M., VLADIMIROVA, D. & EVANS, S. 2018. Sustainable business model innovation: A review. Journal of Cleaner Production, 198, 401-416.

GHAPANCHI, A. H., WOHLIN, C. & AURUM, A. 2014. Resources contributing to gaining competitive advantage for open source software projects: An application of resource-based theory. International Journal of Project Management, 32, 139-152.

GKYPALI, A., FILIOU, D. & TSEKOURAS, K. 2017. R&D collaborations: Is diversity enhancing innovation performance? Technological Forecasting and Social Change, 118, 143-152.

GRIFFIN, A., PRICE, R. L., MALONEY, M. M., VOJAK, B. A. & SIM, E. W. 2009. Voices from the Field: How Exceptional Electronic Industrial Innovators Innovate. The Journal of product innovation management, 26, 222-240.

GUNDAY, G., ULUSOY, G., KILIC, K. & ALPKAN, L. 2011. Effects of innovation types on firm performance. International Journal of Production Economics, 133, 662-676.

HAIR, J. F., BABIN, B. J. & ANDERSON, R. E. 2018. Multivariate Data Analysis, Mason, OH, Mason, OH: Cengage.

HAIR, J. F., HULT, G. T., 2013. A primer on partial least squares structural equations modelling. Portland: Portland: Ringgold, Inc.

HAIR, J. F., SARSTEDT, M., RINGLE, C. M. & MENA, J. A. 2011. An assessment of the use of partial least squares structural equation modelling in marketing research. J. of the Acad. Mark. Sci, 40, 414-433.

HAKALA, H. & KOHTAMÄKI, M. 2010. The Interplay between Orientations: Entrepreneurial, Technology and Customer Orientations in Software Companies. Journal of Enterprising Culture, 18, 265-290.

HAMEL, G. 2001. Leading the revolution. Strategy & Leadership, 29, 4-10.

HAN, Y. & CHEN, G. 2018. The relationship between knowledge sharing capability and innovation performance within industrial clusters. Journal of Chinese Economic and Foreign Trade Studies, 11, 32-48.

HANSEN, T. 2014. Substitution or Overlap? The Relations between Geographical and Non-spatial Proximity Dimensions in Collaborative Innovation Projects. Regional Studies, 49, 1672-1684.

HELSPER, E. & GERBER, M. M. 2012. The Plausibility of Cross-National Comparisons of Internet Use Types. The Information Society, 28, 83-98.

HENDERSON, K. A. 2011. Post-Positivism and the Pragmatics of Leisure Research. Leisure Sciences, 33, 341-346.

HERVAS-OLIVER, J.-L., SEMPERE-RIPOLL, F., ESTELLES-MIGUEL, S. & ROJAS-ALVARADO, R. 2019. Radical vs incremental innovation in Marshallian Industrial Districts in the Valencian Region: what prevails? European Planning Studies, 27, 1924-1939.

HOCK, M., CLAUSS, T. & SCHULZ, E. 2016. The impact of organizational culture on a firm's capability to innovate the business model. R&D Management, 46, 433-450.

HOGAN, S. J. & COOTE, L. V. 2014. Organizational culture, innovation, and performance: A test of Schein's model. Journal of Business Research, 67, 1609-1621.

HSIAO, Y.-C. & WU, M.-H. 2020. How organizational structure and strategic alignment influence new product success. Management Decision, 58, 182-200.

HU, B. 2014. Linking business models with technological innovation performance through organizational learning. European Management Journal, 32, 587-595.

HU, B. & CHEN, W. 2016. Business model ambidexterity and technological innovation performance: evidence from China. Technology Analysis & Strategic Management, 28, 583-600.

HUANG, Z., DU, X. & YU, X. 2015. Home ownership and residential satisfaction: Evidence from Hangzhou, China. Habitat International, 49, 74-83.

HULLAND, J. 1999. Use of partial least squares (PLS) in strategic management research: a review of four recent studies. Strategic management journal, 20, 195-204.

HULT, G. T. M., HURLEY, R. F. & KNIGHT, G. A. 2004. Innovativeness: Its antecedents and impact on business performance. Industrial Marketing Management, 33, 429-438.

HUNT, S. D. 1991. Positivism and paradigm dominance in consumer research: toward critical pluralism and rapprochement.

HUNT, S. D. 1994. On Rethinking Marketing: Our Discipline, Our Practice, Our Methods. European Journal of Marketing, 28, 13-25.

HUNTER, J. 2002. Improving organizational performance through the use of effective elements of organizational structure. Leadership in Health Services, 15, 12-21.

HUTCHINSON, K., FERGIE, R., FLECK, E., JOUFLAS, G. & PARRY, Z. 2021. Flexing the leadership muscle: An international study of entrepreneurial resilience in rural communities during the covid-19 pandemic. Journal of small business strategy, 31, 100-112.

ISLAM, M. Z., JASIMUDDIN, S. M. & HASAN, I. 2015. Organizational culture, structure, technology infrastructure and knowledge sharing. Vine, 45, 67-88.

JACKSON, S. A., GOPALAKRISHNA-REMANI, V., MISHRA, R. & NAPIER, R. 2016. Examining the impact of design for environment and the mediating effect of quality management innovation on firm performance. International Journal of Production Economics, 173, 142-152.

JANICIJEVIC, N. 2011. Methodological approaches in the research of organizational culture. Ekonomski anali, 56, 69-99.

JANICIJEVIC, N. 2013. The mutual impact of organizational culture and structure. Economic annals, 58, 35-60.

JANICIJEVIC, N. 2017. Organizational models as configurations of structure, culture, leadership, control, and change strategy. Economic Annals, 62, 67-91.

JAY BARNEYA, MIKE WRIGHTB, J., D. & KETCHEN, J. 2001. The resource-based view

of the firm Ten years after 1991.
JOHNSON, M., CHRISTENSEN, C. & KAGERMANN, H. 2008. Reinventing Your Business Model. Harvard Business Review, 86, 51.
JOHNSON, P. 2000. Understanding management research: an introduction to epistemology, London Thousand Oaks, London : SAGE.
JULIENTI ABU BAKAR, L. & AHMAD, H. 2010. Assessing the relationship between firm resources and product innovation performance. Business Process Management Journal, 16, 420-435.
KAMASAK, R. 2015. Determinants of innovation Performance: A Resource-based Study. Procedia - Social and Behavioral Sciences, 195, 1330-1337.
KENNEDY, S., WHITEMAN, G. & VAN DEN ENDE, J. 2017. Radical Innovation for Sustainability: The Power of Strategy and Open Innovation. Long Range Planning, 50, 712-725.
KHARABSHEH, R. A. 2015. The impact of competitive strategies on responsive market orientation, proactive market orientation, learning orientation and organizational performance. Journal of Strategic Marketing, 23, 423-436.
KIM, S. K. & MIN, S. 2015. Business Model Innovation Performance: When does Adding a New Business Model Benefit an Incumbent? Strategic Entrepreneurship Journal, 9, 34-57.
KIM, W. C. & MAUBORGNE, R. 1997. Value innovation: the strategic logic of high growth.
HARVARD BUS REV, 75, 102-112.
KIRCA, G. R. A. H. 2012. Firm Innovativeness and Its Performance Outcomes: A Meta-Analytic Review and Theoretical Integration.
KLEIN, A. 2008. Organizational culture as a source of competitive advantage. E-Leader Bangkok.
KLEIN, A. 2011. Corporate culture: its value as a resource for competitive advantage. Journal of Business Strategy, 32, 21-28.
KNOL, J. & VAN LINGE, R. 2009. Innovative behaviour: the effect of structural and psychological empowerment on nurses. J Adv Nurs, 65, 359-370.
KO, G., ROBERTS, D. L., PERKS, H. & CANDI, M. 2021. Effectuation Logic and Early Innovation Success: The Moderating Effect of Customer Co-creation. British journal of management.
KOHLI, A. & JAWORSKI, B. 1990. Market Orientation The construct research propositions and managerial implications. Journal of Marketing, Apr 1990, Vol.54(2), p.1
KRAUSE, N. 2004. Stressors Arising in Highly Valued Roles, Meaning in Life, and the Physical Health Status of Older Adults. J Gerontol B Psychol Sci Soc Sci, 59, S287-S297.
KUNCORO, W. & SURIANI, W. O. 2018. Achieving sustainable competitive advantage

through product innovation and market driving. Asia Pacific Management Review, 23, 186-192.

KWAKU ATUAHENE-GIMA, S. F. S., AND ERIC M. OLSO 2005. The Contingent Value of Responsive and Proactive Market Orientations for New Product Program Performance.

KWAKU. ATUAHENE-GIMA, S. F. S., AND ERIC M. OLSON 2005. The Contingent Value of Responsive and Proactive Market Orientations for New Product Program Performance.

LAFORET, S. 2016. Effects of organisational culture on organisational innovation performance in family firms. Journal of Small Business and Enterprise Development, 23, 379-407.

LAI, V. S. & LI, H. 2005. Technology acceptance model for internet banking: an invariance analysis. Information & management, 42, 373-386.

LAKSHMAN, C., KUMRA, R. & ADHIKARI, A. 2017. Proactive market orientation and innovation in India: The moderating role of intrafirm causal ambiguity. Journal of Management and Organization, 23, 116-135.

LAMBERT, S. C. & DAVIDSON, R. A. 2013. Applications of the business model in studies of enterprise success, innovation and classification: An analysis of empirical research from 1996 to 2010. European Management Journal, 31, 668-681.

LANG, T. M., LIN, S. H. & VY, T. N. T. 2012. Mediate effect of technology innovation capabilities investment capability and firm performance in Vietnam. Procedia - Social and Behavioral Sciences, 40, 817-829.

LANZOLLA, G. & MARKIDES, C. 2020. A Business Model View of Strategy. Journal of Management Studies.

LAWRENCE, P. R. & LORSCH, J. W. 1967. Differentiation and Integration in Complex Organizations. Administrative Science Quarterly, 12, 1-47.

LEIH, S., LINDEN, G. & TEECE, D. J. 2015a. Business Model Innovation and Organizational Design. 24-42.

LEIH, S., LINDEN, G. & TEECE, D. J. 2015b. Business Model Innovation and Organizational Design. Business Model Innovation.

LI, D.-Y. & LIU, J. 2014. Dynamic capabilities, environmental dynamism, and competitive advantage: Evidence from China. Journal of Business Research, 67, 2793-2799.

LI, E. L., ZHOU, L. & WU, A. 2017. The supply-side of environmental sustainability and export performance: The role of knowledge integration and international buyer involvement. International Business Review, 26, 724-735.

LILIEN, G. L. 2016. The B2B Knowledge Gap. International Journal of Research in Marketing, 33, 543-556.

LIM, B. 1995. Examining the organizational culture and organizational performance link. Leadership & organization development journal, 16, 16-21.

LIN, L.-H. 2012. Innovation performance of Taiwanese information firms: An acquisition–learning–innovation framework. Total Quality Management & Business Excellence, 23, 1135-1151.

LINDGREN, P. 2018. Disruptive, Radical and Incremental Multi Business Model Innovation.

LIU, X. & BUCK, T. 2007. Innovation performance and channels for international technology spillovers: Evidence from Chinese high-tech industries. Research Policy, 36, 355-366.

LOK, P. & CRAWFORD, J. 2004. The effect of organisational culture and leadership style on job satisfaction and organisational commitment: A cross-national comparison. The Journal of management development, 23, 321-338.

M.PORTER 1990. Michael-Porter-The-Competitive-Advantage-of-Nations-cover-story. Harvard Business Review.

MADU, B. C. 2012. Organization culture as driver of competitive advantage. Journal of Academic and Business Ethics

MAGRETTA, J. 2002. Why business models matter. Harvard Business Review, 80, 86.

MANSFIELD, E. 1985. How Rapidly Does New Industrial Technology Leak Out? The Journal of Industrial Economics, Dec., 1985, Vol. 34, No. 2 (Dec., 1985), pp.217-223.

MAO, P., LI, S., YE, K. & CAI, H. 2016. A field theory based model for identifying the effect of organizational structure on the formation of organizational culture in construction projects. KSCE Journal of Civil Engineering, 21, 45-53.

MARKIDES, C. 2006. Disruptive Innovation: In Need of Better Theory. J PROD INNOV MANAG 2006; 23:19–25.

MARKIDES, C. & CHARITOU, C. D. 2004. Competing with dual business models: A contingency approach. Academy of Management Perspectives, 18, 22-36.

MARKIDES, C. & SOSA, L. 2013. Pioneering and First Mover Advantages: The Importance of Business Models. Long Range Planning, 46, 325-334.

MARKIDES, C. C. 2013. Business Model Innovation: What Can the Ambidexterity Literature Teach US? Academy of Management Perspectives, 27, 313-323.

MARKIDES, C. C. & GEROSKI, P. A. 2004. Fast second: how smart companies bypass radical innovation to enter and dominate new markets, Hoboken, Hoboken: Wiley.

MARSDEN, D. & LITTLER, D. 1996. Evaluating alternative research paradigms: A market-oriented framework. Journal of Marketing Management, 12, 645-655.

MATEAR, S., OSBORNE, P., GARRETT, T. & GRAY, B. J. 2002. How does market orientation contribute to service firm performance? European Journal of Marketing, 36, 1058-1075.

MCCLELLAND, D. C. 1998. IDENTIFYING competencies with behavior interview. American Psychological Society, VOL. 9, NO. 5,.

MERZ, M. A., HE, Y. & ALDEN, D. L. 2008. A categorization approach to analysing the global consumer culture debate. International marketing review, 25, 166-182.

MIHAELA, D. & AMALIA, D. 2017. BUSINESS MODEL IN THE HOSPITALITY INDUSTRY, FROM TRADITIONAL TO OPEN INNOVATION. Buletin ştiinţific: Universitatea din Piteşti. Seria Ştiinţe Economice, 16, 3-10.

MILKOVICH, G. T. 1987. Compensation systems in high technology companies. In D. B. Balkin & L. R. Gomez-Mejia (Eds.), New perspectives on compensation. Englewood Cliffs, NJ:Prentice-Hall.

MITCHELL, D. & COLES, C. 2003. The ultimate competitive advantage of continuing business model innovation. Journal of Business Strategy, 24, 15-21.

MORRIS, M., SCHINDEHUTTE, M. & ALLEN, J. 2005. The entrepreneur's business model: toward a unified perspective. Journal of Business Research, 58, 726-735.MUSustainability, 11, 1689.

MURATOVIC, H. 2013. Building Competitive Advantage of the Company Based on Changing Organizational Culture. Journal of Economics and Business, 11, 61-76.

N.FOSS, T. S. 2017. Fifteen Years of Research on Business Model Innovation: How Far Have We Come, and Where Should We Go? Journal of management.

NANCY M. P. BOCKEN, I. D. P., CONNY BAKKER & BRAM VAN DER GRINTEN 2016. Product design and business model strategies for a circular economy. Journal of Industrial and Production Engineering.

NARANJO-VALENCIA, J. C., JIM¢NEZ-JIM¢NEZ, D. & SANZ-VALLE, R. 2016. Studying the links between organizational culture, innovation, and performance in Spanish companies. Revista Latinoamericana de Psicología, 48, 30-41.

NARANJO-VALENCIA, J. C., JIMENEZ-JIMENEZ, D. & SANZ-VALLE, R. 2017. Organizational culture and radical innovation: Does innovative behavior mediate this relationship? Creativity and Innovation Management, 26, 407-417.

NARANJO VALENCIA, J. C., SANZ VALLE, R. & JIM¢NEZ JIM¢NEZ, D. 2010. Organizational culture as determinant of product innovation. European Journal of Innovation Management, 13, 466-480.

NARVER, J. C., SLATER, S. F. & MACLACHLAN, D. L. 2004. Responsive and Proactive Market Orientation and New-Product Success. Journal of Product Innovation Management, September 2004, Vol.21(5), pp.334-347.

NEELY, A. 1998. Innovation and Business Performance: A Literature Review. The Judge Institute of Management Studies University of Cambridge 15th Jan 1998.

NGUYEN, M. A. T., LEI, H., VU, K. D. & LE, P. B. 2019. The role of cognitive proximity on supply chain collaboration for radical and incremental innovation: a study of a transition economy. The Journal of business & industrial marketing, 34, 591-604.

NOVAK, A. 2013. Relations Between the Business Model and the Strategy. Kidmore End: Academic Conferences International Limited.

O'CONNOR, G. C. & MCDERMOTT, C. M. 2004. The human side of radical innovation.

Journal of engineering and technology management, 21, 11-30.
OECD 2005. Measurement of Scientific and Technological Activities, Oslo Manual : Guidelines for Collecting and Interpreting Innovation Data, Paris, Paris: Organization for Economic Cooperation & Development.
OGBONNA, E. & HARRIS, L. C. 2000. Leadership style, organizational culture and performance: empirical evidence from UK companies. The International Journal of Human Resource Management, 11, 766-788.
OLSON, E. M., SLATER, S. F. & HULT, G. T. M. 2005. The Performance Implications of Fit among Business Strategy, Marketing Organization Structure, and Strategic Behavior. Journal of Marketing, 69, 49-65.
OLSSON, A. & LARSSON, A. C. 2009. Value creation in PSS design through product and packaging innovation processes.
OSTERWALDER, A. A. P. Y. 2002. An eBusiness Model Ontology for Modelling eBusiness. Constructing the eEconomy, Bled, Slovenia, June 17–19, 2002 (LOEBBECKE C, WIGARD RT, GRICAR J, PUCIHAR A and LENART G, Eds), pp 75–91.
PADILHA, C. K. & GOMES, G. 2016. Innovation culture and performance in innovation of products and processes: a study in companies of textile industry. RAI Revista de Administração e Inovação, 13, 285-294.
PALADINO, A. 2007. Investigating the Drivers of Innovation and New Product Success: A Comparison of Strategic Orientations.
PAN, X., ZHANG, J., SONG, M. & AI, B. 2017. Innovation resources integration pattern in high-tech entrepreneurial enterprises. International Entrepreneurship and Management Journal, 14, 51-66.
PATRICK MCLAUGHLIN, J. B., PALIE SMART 2008. Developing an organisation culture to facilitate radical innovation. International Journal of Technology Management, 2008 Vol.44 No.3/4.
PELS, J. & KIDD, T. A. 2015. Business model innovation learning from a high-tech-low-fee medical healthcare model for the BOP. International Journal of Pharmaceutical and Healthcare Marketing, 9, 200-218.
PETERAF, M. 1993. The cornerstones of competitive advantage: a resource-based view. Strategic management journal.
PETTIGREW, A. M. 1979. ON STUDYING ORGANIZATIONAL CULTURES. Administrative Science Quarterly, 24, 570-581.
PHILIPSON, S. 2016. Radical innovation of a business model. Competitiveness Review, 26, 132-146.
PIPEROPOULOS, P., WU, J. & WANG, C. 2018. Outward FDI, location choices and innovation performance of emerging market enterprises. Research Policy, 47, 232-240.
POORNIMA MATHUR, M. N. 2015. Organization Structure a Key to Driver to Competitive

Advantage. International Journal of Management and Commerce Innovations ISSN 2348-7585 (Online) Vol. 3, Issue 2, pp: (348-356).

PORTER, M. 1985. COMPETITIVE ADVANTAGE. Free press, New York, NY.

POWELL, T. C. 1992. Organizational alignment as competitive advantage. Strategic Management Journal, 13, 119-134.

PRENDEVILLE, S. M., AMP, APOS, CONNOR, F., BOCKEN, N. M. P. & BAKKER, C. 2017. Uncovering ecodesign dilemmas: A path to business model innovation. Journal of Cleaner Production, 143, 1327-1339.

PRIEM, R. L., WENZEL, M. & KOCH, J. 2018. Demand-side strategy and business models: Putting value creation for consumers center stage. Long Range Planning, 51, 22-31.

PURKAYASTHA, A. & SHARMA, S. 2016. Gaining competitive advantage through the right business model: analysis based on case studies. Journal of Strategy and Management, 9, 138-155.

RAJAPATHIRANA, R. P. J. & HUI, Y. 2018. Relationship between innovation capability, innovation type, and firm performance. Journal of Innovation & Knowledge, 3, 44-55.

RANJITH, V. K. 2016. Business Models and Competitive Advantage. Procedia Economics and Finance, 37, 203-207.

RICHARD L. PRIEM & JOHN E. BUTLER 2001. Is the resource-based view a useful perspective for strategic management research. Academy of management.

RICHARDSON, J. 2008. The business model: an integrative framework for strategy execution. Strategic Change, 17, 133-144.

RIFAT, K. 2017. The contribution of tangible and intangible resources, and capabilities to a firm's profitability and market performance. European Journal of Management and Business Economics, 26, 252-275.

RIJSDIJK, S. A. & VAN DEN ENDE, J. 2011. Control Combinations in New Product Development Projects. The Journal of product innovation management, 28, 868-880.

ROBSON, C. 2002. Real world research (2nd edn). Oxford;Blackwell.

ROSENBLOOM, H. C. A. R. S. 2002. The role of the business model in capturing value from innovation: evidence from Xerox Corporations technology spin-off companies.

ROSENBUSCH, N., BRINCKMANN, J. & BAUSCH, A. 2011. Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs. Journal of Business Venturing, 26, 441-457.

SAEBI, T., LIEN, L. & FOSS, N. J. 2017. What Drives Business Model Adaptation? The Impact of Opportunities, Threats and Strategic Orientation. Long Range Planning, 50, 567-581.

SARSTEDT, M., RINGLE, C. M., SMITH, D., REAMS, R. & HAIR, J. F. 2014. Partial least squares structural equation modelling (PLS-SEM): A useful tool for family business researchers. Journal of Family Business Strategy, 5, 105-115.

SAUNDERS, M., LEWIS, P. & THORNHILL, A. 2009. Research Methods for Business Students, Pearson Education M.U.A.

SCHEIN, E. 1985. Organizational culture and leadership: a dynamic view. San Francisco, CA: Jossey-Bass.

SCHEIN, E. H. 1984. Coming to a New Awareness of Organizational Culture. Sloan management review, 25, 3-14.

SCHNEIDER, S. 2019. How to approach business model innovation: the role of opportunities in times of (no) exogenous change. R&D Management, 49, 399-420.

SHAFER, S. M., SMITH, H. J. & LINDER, J. C. 2005. The power of business models. Business Horizons, 48, 199-207.

SHAHZAD, F., XIU, G. & SHAHBAZ, M. 2017. Organizational culture and innovation performance in Pakistan's software industry. Technology in Society, 51, 66-73.

SHARDA, B. D. & MILLER, G. A. 2001. Culture and Organizational Structure in the Middle East: A Comparative Analysis of Iran, Jordan and the USA. International Review of Sociology, 11, 309-324.

SHELTON, C. 2011. The impact of organisational culture and person-organisation fit on job satisfaction and organisational commitment in China and the USA. Int. J. Management Development, Vol. 1, No. 1, 2011

SHRADER, R. C. & SIMON, M. 1997. Corporate versus independent new ventures: Resource, strategy, and performance differences. Journal of Business Venturing, 12, 47-66.

SITOH, M. K., PAN, S. L. & CHING-YING YU, S. L. 2014. Business Models and Tactics in New Product Creation: The Interplay of Effectuation and Causation Processes. Engineering Management, IEEE Transactions on, 61, 213-224.

SKIVINGTON, J. E. & DAFT, R. L. 1991. A STUDY OF ORGANIZATIONAL 'FRAMEWORK' AND 'PROCESS' MODALITIES FOR THE IMPLEMENTATION OF BUSINESS-LEVEL STRATEGIC DECISIONS*. Journal of Management Studies, 28, 45-68.

SLATER, S. F., MOHR, J. J. & SENGUPTA, S. 2014. Radical Product Innovation Capability: Literature Review, Synthesis, and Illustrative Research Propositions. Journal of Product Innovation Management, 31, 552-566.

SLATER, S. F. & NARVER, J. C. 1990. The Effect of a Market Orientation on Business Profitability.

SLñVIK, Š. 2017. IDENTIFICATION OF RELATION BETWEEN BUSINESS MODEL AND BUSINESS STRATEGY AND MEASUREMENT OF ITS TIGHTNESS. Problems of Management in the 21st Century, 12, 54-69.

SNIHUR, Y. 2018. Searching for Innovation Product Process and Business Model Innovations and Search.

SOUSA-ZOMER, T. T. & CAUCHICK MIGUEL, P. A. 2018. Sustainable business models as

an innovation strategy in the water sector: An empirical investigation of a sustainable product-service system. Journal of Cleaner Production, 171, S119-S129.
SOUTO, J. E. 2015. Business model innovation and business concept innovation as the context of incremental innovation and radical innovation. Tourism Management, 51, 142-155.
SPANOS, Y., PRASTACOS, G. & PAPADAKIS, V. 2001. Greek Firms and EMU: Contrasting SMEs and Large-Sized Enterprises. European Management Journal, 19, 638-648.
STATSENKO, L. & CORRAL DE ZUBIELQUI, G. 2020. Customer collaboration, service firms' diversification and innovation performance. Industrial marketing management, 85, 180-196.
SUBRAMANIAM, M. & YOUNDT, M. A. 2005. The Influence of Intellectual Capital on the Types of Innovative Capabilities. Academy of Management Journal, 48, 450-463.
SULTAN, N. & VAN DE BUNT-KOKHUIS, S. 2012. Organisational culture and cloud computing: coping with a disruptive innovation. Technology Analysis & Strategic Management, 24, 167-179.
SUN, B. & LIU, Y. 2020. Business model designs, big data analytics capabilities and new product development performance: evidence from China. European Journal of Innovation Management, ahead-of-print.
SVENSSON, L. E. O. & WOODFORD, M. 2003. Indicator variables for optimal policy. Journal of monetary economics, 50, 691-720.
TASHAKKORI, A. A. T., C. 2003. Handbook of Mixed Methods in Social and Behavioural Research. Thousand Oaks, CA: Sage.
TEECE, D. J. 1986. Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy. Research Policy, 1986, Vol.15(6), pp.285-305.
TEECE, D. J. 2006. Reflections on “Profiting from Innovation”. Research Policy, 35, 1131-1146.
TEECE, D. J. 2007. Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. Strategic Management Journal, 28, 1319-1350.
TEECE, D. J. 2010a. Business Models, Business Strategy and Innovation. Long Range Planning, 43, 172-194.
TEECE, D. J. 2018a. Business models and dynamic capabilities. Long Range Planning, 51, 40-49.
TEECE, D. J. 2018b. Dynamic capabilities as (workable) management systems theory. Journal of Management & Organization, 1-10.
TEECE, D. J. & LINDEN, G. 2017. Business models, value capture, and the digital enterprise. Journal of Organization Design, 6.
TEECE, D. J., PISANO, G.P., SHUEN, A., 1997. Dynamic capabilities and strategic management. . Strategic Manag. J. 18, 509-533.

TEECE, V. S. K. C. N. P. D. J. 2010b. Introduction: On the nature and scope of dynamic capabilities. Industrial and Corporate Change, Volume 19, Issue 4, 1 August 2010, Pages 1175–1186,.

TENBRINK, C. & GELB, B. 2017. When firms mature: keeping the ho-hum at bay and embracing change. Journal of Business Strategy, 38, 12-17.

TIMMERS, P. 1998. Business Models for Electronic Markets. Electronic market, 8(2); 3-8.

TODESCHINI, B. V., CORTIMIGLIA, M. N., CALLEGARO-DE-MENEZES, D. & GHEZZI, A. 2017. Innovative and sustainable business models in the fashion industry: Entrepreneurial drivers, opportunities, and challenges. Business Horizons, 60, 759-770.

TULL, D. S. & HAWKINS, D. I. 1990. Marketing research : measurement & method : a text with cases, New York : London, New York : Macmillan London : Collier Macmillan.

VELU, C. 2016. Evolutionary or revolutionary business model innovation through coopetition? The role of dominance in network markets. Industrial Marketing Management, 53, 124-135.

VELU, C. & KHANNA, M. 2013. Business model innovation in India. Journal of Indian Business Research, 5, 156-170.

WAGHMARE, R. B. & GOLHAR, D. 2017. Knowledge Creation at Incubation for Business Model Innovation: The Conceptual Understanding. Journal of Commerce and Management Thought, 8.

WAGNER, C., MANNION, R., HAMMER, A., GROENE, O., ARAH, O. A., DERSARKISSIAN, M. & SU International Journal for Quality in Health Care, 26, 74-80.

WAHYUNI, D. 2012. The Research Design Maze: Understanding Paradigms, Cases, Methods and Methodologies. Journal of Applied Management Accounting Research; Clayton North Vol. 10, Iss. 1, (Winter 2012): 69-80.

WANG, C. & HAN, Y. 2011. Linking properties of knowledge with innovation performance: the moderate role of absorptive capacity. Journal of Knowledge Management, 15, 802-819.

WANG, G., DOU, W., ZHU, W. & ZHOU, N. 2015. The effects of firm capabilities on external collaboration and performance: The moderating role of market turbulence. Journal of Business Research, 68, 1928-1936.

WANG, Y., CHEN, Y., WANG, N., NEVO, S., KOU, G. & ALSAADI, F. E. 2019. Impact of the Strategic Role of IT on Explorative and Exploitative Innovation Activities: The Role of Environmental Uncertainty. Decision Sciences,

WEERAWARDENA, J. M., G.S. SALUNKE, S. KNIGHT, G. LIESCH, P.W. 2015. The role of the market sub-system and the socio-technical sub-system in innovation and firm performance: a dynamic capabilities approach. Journal of the Academy of Marketing Science, 43, 221-240.

WEST, D. C., ACAR, O. A. & CARUANA, A. 2020. Choosing among alternative new product development projects: The role of heuristics. Psychology & marketing, 37, 1511-1524.

WILDEN, R. & GUDERGAN, S. P. 2014. The impact of dynamic capabilities on operational marketing and technological capabilities: investigating the role of environmental turbulence. Journal of the Academy of Marketing Science, 43, 181-199.

WILLIAMS, L. J. & HAZER, J. T. 1986. Antecedents and Consequences of Satisfaction and Commitment in Turnover Models: A Reanalysis Using Latent Variable Structural Equation Methods. Journal of applied psychology, 71, 219-231.

WIRTZ, B. W., PISTOIA, A., ULLRICH, S. & GLong Range Planning, 49, 36-54.

WONG, K. K.-K. 2019. Mastering Partial Least Squares Structural Equation Modelling (PLS-SEM) SPLS 38 Hours. iUniverse 1663 Liberty Drive Bollmiungton., IN 47403.

WOODMAN, R. W., SAWYER, J. E. & GRIFFIN, R. W. 1993. Toward a Theory of Organizational Creativity. The Academy of Management review, 18, 293-321.

WU, H., CHEN, J. & JIAO, H. 2016. Dynamic capabilities as a mediator linking international diversification and innovation performance of firms in an emerging economy. Journal of Business Research, 69, 2678-2686.

YAM, R. C. M., LO, W., TANG, E. P. Y. & LAU, A. K. W. 2011. Analysis of sources of innovation, technological innovation capabilities, and performance: An empirical study of Hong Kong manufacturing industries. Research Policy, 40, 391-402.

YIN, R., K. 2003. Case study research; Design and method (3rd edn). London:sage.

ZHANG, H., LIANG, X. & WANG, S. 2016. Customer value anticipation, product innovativeness, and customer lifetime value: The moderating role of advertising strategy. Journal of Business Research, 69, 3725-3730.

ZHANG, M., QI, Y., WANG, Z., PAWAR, K. S. & ZHAO, X. 2018. How does intellectual capital affect product innovation performance? Evidence from China and India. International Journal of Operations & Production Management, 38, 895-914.

ZHENG, W., YANG, B. & MCLEAN, G. N. 2010. Linking organizational culture, structure, strategy, and organizational effectiveness: Mediating role of knowledge management. Journal of Business Research, 63, 763-771.

ZHENG, W., YANG, B. & MCLEAN, G. N. 2013. Linking organizational culture, structure, strategy, and organizational effectiveness: Mediating role of knowledge management. Journal of Business Research, 63, 763-771.

ZOTT, C. & AMIT, R. 2007. Business Model Design and the Performance of Entrepreneurial Firms. Organization Science, 18, 181-199.

ZOTT, C. & AMIT, R. 2009. Designing your future business model: An activity system perspective. IDEAS Working Paper Series from RePEc.

ZOTT, C. & AMIT, R. 2010. Business Model Design: An Activity System Perspective. Long Range Planning, 43, 216-226.

ZOTT, C. & AMIT, R. 2012. Creating Value Through Business Model Innovation. MIT Sloan Management Review,.

ZOTT, C. & AMIT, R. 2013. The business model: A theoretically anchored robust construct for strategic analysis. Strategic organization, 11, 403-411.

ZOTT, C., RAPHAEL, A. & MASSA, L. 2011. The Business Model: Recent Developments and Future Research. Journal of Management, 37, 1019-1042.

ZVI H. ARONSON, R. R. R. & LYNN, A. G. S. 2008. The role of leader personality in new product development success: An examination of teams developing radical and incremental innovations. . Int. J. Technology Management, Vol. 44, Nos. 1/2, 2008.

Appendices

Appendix A E-mail to the companies

Dear_____

Greetings. My name is Chia-Hao Chou, a PhD student from Marketing Department of University of Strathclyde, UK. I would like to thank you for your kind willingness to participate this study titled: **Business model as the engagements in accessing innovation performance**. [This study is being done by Chia-Hao Chou from the University of Strathclyde.

This research aims to explore what gives a company a competitive advantage in developing successful innovations? Specifically, if a distinctive business model facilitates the company to access the performance of its developed innovation?

In relation to the aim of this research, we would like to access the ideas of the strategy makers (CEO/COO/Founder/High level manager…etc) in the context of high-technology companies. Therefore, you are invited as the interviewee of this research. You are kindly requested to answer twelve primary questions. You are anticipated to take 2~3 minutes on answering each primary question. However, a probing question followed by the primary questions will be given to you if your response didn't provide sufficient information to the explanation or exploration to the questions. Therefore, the whole interview is expected to take 35~45 minutes for primary questions and probing questions in need.

We don`t anticipate any risk associated with your participation. However, your participation is entirely voluntary and you are free to withdraw from the project at any time, up to the point of completion, without having to give a reason.

The information collected is mainly related to the ideas of business model, innovation performance, organisational structure and organisational culture. Meanwhile, practical case proceed or progressing in the company and participants' experiences might also be revealed in the interview. However, none of the personal or identifiable information will be presented in the data.

Your participation in this study will remain confidential, and only anonymised data will be published, thus no information that identifies you will be made publicly available. Your response will be kept for 3 years (2019 Nov~2022 Nov) as the duration of this investigation proceeded for research purpose only and it will be shared within this research investigators only.

The personal information of the participants will be kept confidentially and only accessible to the investigators. Any summary interview content, or direct quotations from the interview, that are made available through academic publication or other

academic outlets will be anonymized so that you cannot be identified, and care will be taken to ensure that other information in the interview that could identify yourself is not revealed

The collected information derived from your response will be stored in the investigator's university's cloud space and the electrical device (laptop/backup hard drive) with password protected for 3 years for research purpose only (2019 Nov~2022 Nov as the duration of this investigation proceeded). The main body of the raw data will be stored separately from the key for code names.

Thank you for reading this information – If you have any question regarding the survey or study in general, please do not hesitate to contact me via-mail.

Chia-Hao Chou

PhD student

Department of Marketing

University of Strathclyde

E-mail: chiahao.chou@strath.ac.uk

Appendix B Qualitative Interview question

The in-depth interview instrument:

The structure of the interview:

- What is a business model?
- What makes a business model?
- How do you access the performance of the innovation you develop?
- How do Structure and culture affect the impact of the business model on innovation performance?

The points to start-up the interview (Ice breaking):

(1). The introduction of myself.
(2). Explain the purpose of this research/study.
(3). Why this research is significant?
(4). Why you are an appropriate interview participants in this research?
(5). How this interview will be conducted (The prepared number of questions/the requiring period of time/the need of recording the conservation…etc)
(6). All the material provided in the interview will be confidential and only applied for this academic utilization.

The questions for conducting the interview:

Warm up:

(0) First of all, many thanks for your kind willing and time to participate in this interview. Do you mind if we start by talking about you and your company? Could you first describe what are your company's main product and business? Meanwhile, what are your position and function?

Interview structure theme 1 & 2:
:

1. **What is a business model?**
2. **What makes a business model?**

Bullet points:

- To explore the meaning/importance/aims of BM.
- To explore the contents/components of BM.
- To explore what drives a company to adopt a specific kind of BM.

Questions:

(1) "Many companies and managers talk about their 'business-model'. Yet, different people give different meanings to 'business-model'. Could you please help me to understand, in your view, **what does a business model mean?** (What is a business model??)

* Could you kindly describe, in your opinion, what is BM?
* Could you further describe the role of BM while a company is getting the start or operation of its business? If that is important? Why?
* How do you identify if a BM is successful or not?
* Among all the given information, could you share your own definition of BM?

(2). OK! I see. So, given this definition, could you please describe in some more detail about the BM that your company pursues / has? (What is the business model you are adopting??)

*For example, could you describe the BM that your company is adopting now?
*Is there any goal(s) that your company attempts to achieve by adopting this BM?
IF yes, could you first share with us what goal (s) it is? How do you apply your BM effectively to reach your goal(s)?
*Is there any particular focus or theme that embeds in your current BM? If yes, could you explain what it is and why that matters to you/your company?
*Could you share with me why this is the way you conduct your business? In other words, why you choose/create this BM?

(3). Thank you for this insightful description ! Based on the given definition of your BM and your description of your company's BM, what elements would you consider to be key in comprising the BM of your company? (What makes your business model??)

* Could you further describe how do these elements frame your BM? For instance, an actually happened case which elaborates how these elements working together on comprising your BM?
* Could you also share why these elements were applied in your BM? For example, are these elements were incorporated in you BM under the design, or conversely your BM was developed underpinning by what you have in hands?

(4). Could you think of any alternative BM that your company could have followed? For instance, the model some of your competitors follow perhaps? So, what BM do your competitors have? (Why you adopt your current business model?)

(If the interviewees have their BM which is significantly different from the main competitors' BM)
*Why you have chosen NOT to follow their BM?

(If NOT a start-up)
*Has this been the company's business model all along? I mean, was this company ever forced to change it BM?
If (No): *Why?

If (Yes): *What drove this decision?
*What were the main challenges while trying to shift your BM?
*How did you meet these challenges?

Interview structure theme 3:

3: How do you access the performance of the innovation you develop?

Bullet points:

- To explore the meaning/influence/type of innovation.
- To explore the types of performance driven by the innovation.
- To explore what facilitates the performance of the developing innovations?

Questions:

(5). Do you have any innovative project processed recently or in progress now? (If yes) Could you please describe in some more detail about the innovation your company had developed or developing? (What kind of innovation you were/are developing?)

(6). Thank you for the sharing ! Based on your given definition and description of your company's innovation, could you describe **how** do you identify the success, or the measuring way, of performance of your developed innovation? (The identification of the type of innovation performance?)

(7). That is interesting ! Thanks. Now, by following to your previous description, could you further tell me how do you access your innovation performance? **Is there anything** that helps you to access your innovation performance? (What facilitates the company to gain its innovation performance?? BM???)

(If Yes):
*Could you describe what help(s) you accessing your innovation performance?
(If Not):
* Could you describe how do you access your innovation performance?

4: How do Structure and Culture affect the impact of the business model on innovation performance?

Bullet points:

- To explore the role and influence of organizational structure and culture on affecting how business model impacts the innovation performance.
- To explore, if any, the specific theme and elements of business structure and culture have impact on how business model affects the innovation performance.

Questions:

(8). In your previous description (regarding how to access innovation performance), you have mentioned xxxxxxxxx (organizational culture related) and/or ooooooooo (organizational structure related). Could you please help me to understand, in your opinion, what does xxxxxxxxx and/or ooooooooo mean?

OR

In terms of organizational culture and structure, both of them have been considered as the factors affect the firm's performance". Could you please help me to understand, in your opinion, what is your company's organisational culture and/or organisational structure?

(9). Based on your description and definition of your innovation performance. Does your organizational culture and/or organizational structure also affect the access of your innovation performance?

(IF Yes): Could you please help me to understand what kind (type, meaning…etc) of OC and OS affect your access of innovation performance?

(IF No): Why does OC and OS have no role on affecting your access of innovation performance?

(What kind of organizational and/or organizational structure have impact on innovation performance?)

(10).Could you please describe in some more detail about how the BC and/or BS that affect the access of your innovation performance?

(11). Based on the given description and definition of the BC and/or BS of how it affect your company's innovation performance, what elements would you consider to be key in comprising the BC and/or BS of your company? (What makes your business culture and/or business structure??)

(12).In your opinion, could you think of any way to describe the relationship, if any, between BM, BC and BS on facilitating your access of innovation performance??

(If Yes) Could you kindly provide more detail about how does OC and OS interact with BM toward the access of innovation performance?

(If No) Why does OC and OS have no interaction with BM on affecting your access of innovation performance? (How does BC and BS work with BM on facilitating Innovation performance??)

Appendix C Quantitative Questionnaire.

P1.

Welcome to the survey. The aim of this research is to understand how "New Product Development" affects innovation performance in your company.

Section 1: Innovation type of new product.
Section 2: Organisational culture and structure.
Section 3: Elements to help "New product development."
Section 4: Company's capabilities, resources, and activities drive innovation.
Section 5. Innovation success.
Section 6. Company demographics.

Remember, your answers are fully anonymised, and you can withdraw from completing this questionnaire at any time you wish

P2.

Innovation and new product.

Thank you for your time participating in this survey.

For the purpose of this study, we define "**a New Product**" as a product that is or was developed from the company for the first time (hence "new").

Such "new product" usually aim to either fulfil a new/emerging customer need or improve the way the company responds to existing customer needs, for instance, with new features or improved products design or performance.

P.3

During the past 18 months, has your company developed such a "new product"?

( ) NO! à Stop right there! There is no need to complete this questionnaire. à Ending page
( ) YES! à go to P.4

P4

(YES) à

Excellent! New product development is always exciting and usually good news for most companies. Crucially, you are in a unique position to help this study to meet its objectives.

If you have developed more than one "New product", please focus on the most recent one you developed during the past 18 months and complete this questionnaire with this specific new product in mind.

OTHERWISE, please complete this questionnaire having in mind the specific new product you developed during the past 18 months.

Now, please start this survey by turning to the next page!

P.5

Section 1: The innovation type of the new product.

This section aims to identify which kind of innovations your company has applied to develop the new product.

P.6

Q1.

All new products entail a certain degree of innovation. Some "radical", some "incremental." Please indicate the kind of innovation (radical vs incremental) upon which the "new product" in question is employed.

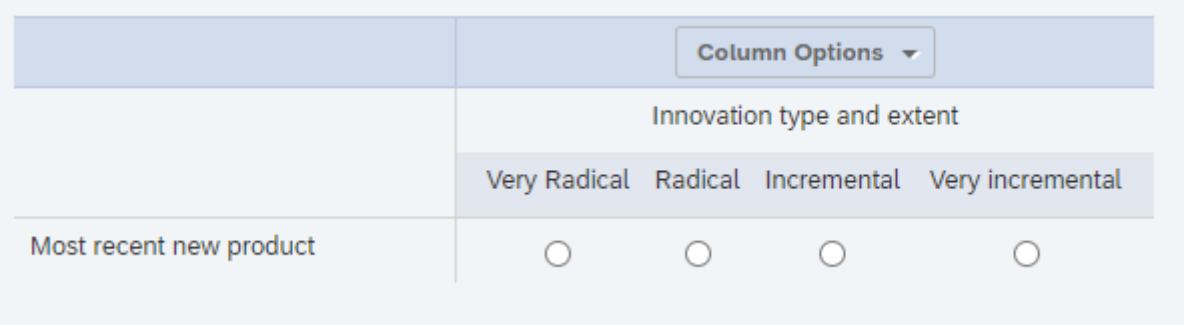
Please read the two definitions outlined below and select the attribution that can best describe your most recent innovative project/product (within the past 18 months). In the questionnaire, "Radical innovation" and "Incremental innovation" represent two different characteristics of innovation, neither is better nor worse than the other.

*Radical innovation:
A new-to-the-world product that disrupts the existing consumer habits and behaviors, and the current competitors' success (e.g., the invention of T.V)

*Incremental innovation:
A product that evolves/improves based on the company's existing offerings and technologies. (e.g., making a lighter and faster laptop)

P.7

To answer, please reflect on your "Most recent new product" and choose by ticking the "ONE" column that best describes the innovation type and extent corresponding to your new product.



P.8

Section 2: **Organisational culture and structure facilitate**

This section means assessing the organisational structure and organisational culture applied by your company which your new product's performance is facilitated. (This section will take you about 3 minutes to complete)

P.9

Q2:

Previous studies suggest that certain company practices are key in developing a successful new product, while others are not. A summary of these activities follows.

From your own experiences, for the "New product" in question, can you indicate how important each of the following activities was? Answer with a 5-point scale. (1=" Totally Unimportant" to 5=" Totally Important.")

(It shall take you about 3 minutes to complete.)

P.10

"When thinking of our work activities, how important are the following factors in helping new products reach the intended performances?"

	Totally Unimportant	Unimportant	Neither Important nor Unimportant	Important	Totally Important
Learning culture.					
Work together in groups to develop better solutions to problems.	(1)	(2)	(3)	(4)	(5)
When the current practices need to be challenged, we will have people in this company question the way things are done.	(1)	(2)	(3)	(4)	(5)
When we acknowledge that no one can know all the answers that we need, we stimulate our internal learning occurring more often.	(1)	(2)	(3)	(4)	(5)
We can predict where new developments in our industry appear. (e.g., advanced technology, new business model)	(1)	(2)	(3)	(4)	(5)
Risk taking culture.					

Long term outcomes and short term results matter equally.	(1)	(2)	(3)	(4)	(5)
Learning from mistakes is more important than blaming people who make them.	(1)	(2)	(3)	(4)	(5)
Independent thinking is encouraged in this company for all our employees to generate and try new ideas.	(1)	(2)	(3)	(4)	(5)
Leadership risk tolerance culture.					
Management team rewards all our employees in this company for working on new ideas.	(1)	(2)	(3)	(4)	(5)
Management team has a strong desire for high risk, high return projects.	(1)	(2)	(3)	(4)	(5)
Management team encourages all our employees in this company to keep trying even if they might fail in the process of creating something new.	(1)	(2)	(3)	(4)	(5)
Specialisation structure.					
Have a large number of internal "specialists" who perform activities only in relation to their specific fields.	(1)	(2)	(3)	(4)	(5)
All employees in our company are expected to have a high level of knowledge and skills on their assigned responsibilities to better conduct the tasks than other companies' employees can do.	(1)	(2)	(3)	(4)	(5)
Formalisation structure.					
All our employees must follow the company's	(1)	(2)	(3)	(4)	(5)

"rulebook" to conduct their daily work.					
All our employees must follow strict operational procedures to conduct their work assignment at all times.	(1)	(2)	(3)	(4)	(5)
We continuously ask our employees to follow proper communication channels (internal/external) to complete their work.	(1)	(2)	(3)	(4)	(5)
(De) centralisation structure.					
Individual decision-makers in our company have wide latitude in choosing the methods to accomplish goals.	(1)	(2)	(3)	(4)	(5)
Front-line managers in our company have been offered flexibility in how to complete the work.	(1)	(2)	(3)	(4)	(5)
Front-line managers in our company have substantial autonomy in decision-making under their work scope.	(1)	(2)	(3)	(4)	(5)

P.11

Section 3: Business model elements.

This section aims to assess the elements/components of your business model that enable your company to be competitive in the market through your developed innovation.

P.12 **Innovation of the value creation.**

Q3: To create innovation and develop new products is something that many companies find challenging. We have summarised how different companies try to meet these challenges. Please use a 5-point scale (1= "Totally Disagree" to 5= "Totally Agree") to indicate how each of the following statements reflects on your company. (It shall take you about 2 minutes to answer this question.)

"In our efforts to create innovation and successful new product..."	Totally Disagree	Disagree	Neither	Agree	Totally Agree

New capabilities.					
Our employees in the new product development project receive training to develop new capabilities.	(1)	(2)	(3)	(4)	(5)
Our employees in the new product development project have very up-to-date knowledge and competencies compared to our main competitors'.	(1)	(2)	(3)	(4)	(5)
We reflect on which new competencies that we need enabling us to adapt to changing market requirements.	(1)	(2)	(3)	(4)	(5)
New technology/equipment.					
We keep our technical resources up-to-date.	(1)	(2)	(3)	(4)	(5)
We make our technical equipment more innovative than our competitors.	(1)	(2)	(3)	(4)	(5)
We use new technical opportunities to extend our product/service portfolio.	(1)	(2)	(3)	(4)	(5)
New partnerships.					
We constantly search for new partners to collaborate with (e.g., suppliers, consultants, advisors, sub-contractors).	(1)	(2)	(3)	(4)	(5)
We continuously use opportunities that arise from integrating new partners into our process (e.g., product design, production, distribution process.)	(1)	(2)	(3)	(4)	(5)
Our new collaboration partners constantly help us to further develop our business model.	(1)	(2)	(3)	(4)	(5)
We constantly evaluate the potential benefits of outsourcing.	(1)	(2)	(3)	(4)	(5)
New processes.					
We improve our internal processes (e.g., product design, production, distribution.).	(1)	(2)	(3)	(4)	(5)
We use innovative procedures/processes during the manufacturing of the new product.	(1)	(2)	(3)	(4)	(5)
We review and change our existing process if needed.	(1)	(2)	(3)	(4)	(5)

P.13: **Innovations of the value proposition.**

Q4: To generate something that is of value, some companies look for inspiration from the market (customers and competitors). Others draw from their own experiences and expertise. Both ways can be equally successful. The following statements present some alternatives featuring both approaches.

Please use a 5-point scale (1= "Totally Disagree" to 5= "Totally Agree") to indicate how each of them reflects on your company.

(It shall take you about 2 minutes to answer this question.)

"While delivering the new product…"	Totally Disagree	Disagree	Neither	Agree	Totally Agree
New offerings.					
We seek to address new, unmet customer needs.	(1)	(2)	(3)	(4)	(5)
We struggle to ensure that our new product/service is more innovative than our competitors.	(1)	(2)	(3)	(4)	(5)
We strive to ensure that our new product/service provides a better solution to meet customer needs which our competitors fail to address.	(1)	(2)	(3)	(4)	(5)
New customers and markets.					
We take opportunities that arise in emerging markets to introduce our new product/service.	(1)	(2)	(3)	(4)	(5)
We seek to address new, unserved market segments.	(1)	(2)	(3)	(4)	(5)
We constantly seek new customer segments and market for our new product/service.	(1)	(2)	(3)	(4)	(5)
New customer relationships.					
We increase customer retention by offering new products/services to our customers.	(1)	(2)	(3)	(4)	(5)
We take innovative/modern actions to improve our customer retention (e.g., Corporate Social Responsibility).	(1)	(2)	(3)	(4)	(5)
New channels.					
We constantly adopt new distribution channels.	(1)	(2)	(3)	(4)	(5)
We continuously review and change our distribution channels.	(1)	(2)	(3)	(4)	(5)
We consistently change our portfolio of distribution channels.	(1)	(2)	(3)	(4)	(5)

P.14 **Innovations of the value capture.**

Q5: Which of the following statement BEST describes how your new product sought to compete in the market? (It shall take you about 1 minute to answer this question.)

(1) ( ) Delivering superior technology/performance than what your competitors can offer
(2) ( ) Meeting specific needs and wants of a specific forget market/segment.
(3) ( ) Offering less expensive, more economical alternative for the customers (existing and potential)

Q6: In addition to many different performance criteria, generating "REVENUE" is also important for the new product. Different companies take different actions to ensure new products deliver back the amount of revenue that the management team expects. In the following list, we summarise some of such actions. Please use a 5-point scale (1= "Totally Irrelevant" to 5= "Totally Relevant") to indicate how relevant each of the actions in this list is for your company. (It shall take you about 2 minutes to answer this question.).

"To ensure our new product meets revenue related performance objectives…"	Totally Irrelevant	Irrelevant	Neither	Relevant	Totally Relevant

New revenue models.					
We develop new revenue approaches (e.g., additional sales, cross-selling).	(1)	(2)	(3)	(4)	(5)
We offer more integrated services (e.g., maintenance contracts) to our customers to create long-term revenue flow.	(1)	(2)	(3)	(4)	(5)
We develop long-term revenue approaches (e.g., leasing) to complement or replace the existing short-term transactions (e.g., single project, one-time sale) to secure our regular revenue flow in the long run.	(1)	(2)	(3)	(4)	(5)
We do not merely rely on our existing revenue sources but keep exploiting new ones to secure the anticipating revenue flow.	(1)	(2)	(3)	(4)	(5)
New cost structures.					
We constantly reflect on the cost structure of the new product.	(1)	(2)	(3)	(4)	(5)
We actively seek opportunities to reduce our manufacturing costs of the new product.	(1)	(2)	(3)	(4)	(5)
We constantly monitor and revise our production costs in responding to the market prices of similar products.	(1)	(2)	(3)	(4)	(5)

P.15

Section 4: Capabilities, resources, and activities.

This section attempts to assess the capabilities, the resources and the activities that your company had and applied to develop and deliver the innovative product.

P.16 : Market-link capabilities

Q7: Different companies have different capabilities that will allow them to compete in the market. Clearly, not one company can have all the capabilities. In the list below, we summarise some of such capabilities.

Please use a 5-point scale (1= "Never to 5= "Constantly) to indicate which of these capabilities you have.

(It shall take you about 2 minutes to answer this question.)

"To ensure the competitiveness of our new product, we…"	Never	Rarely	Sometimes	Frequently	Constantly
Strategic planning capability.					
Identify our competitiveness in the market by conducting a systematic analysis of our internal strengths and weaknesses.	(1)	(2)	(3)	(4)	(5)
Identify our competitiveness in the market by conducting a systematic analysis of our external opportunities and threats.	(1)	(2)	(3)	(4)	(5)

Have clear goals for our new product/process development.	(1)	(2)	(3)	(4)	(5)
Set clear plans with measurable milestones for our new product/process development.	(1)	(2)	(3)	(4)	(5)
Highly adapt and respond to the changes taking place in the external environment (Marco/Micro).	(1)	(2)	(3)	(4)	(5)
Strategy innovation capability.					
Redefine the focus of our business to adapt to the market changes.	(1)	(2)	(3)	(4)	(5)
Identify the implications of our redefined business.	(1)	(2)	(3)	(4)	(5)
Identify new business strategies to redefine the focus of our business.	(1)	(2)	(3)	(4)	(5)
Identify the core competencies that enable us to implement the new strategies.	(1)	(2)	(3)	(4)	(5)
Identify developing market segments.	(1)	(2)	(3)	(4)	(5)
Identify the existing market segments that have been neglected by our competitors.	(1)	(2)	(3)	(4)	(5)
Create new market segments.	(1)	(2)	(3)	(4)	(5)
Stimulate the emergence of new customer needs.	(1)	(2)	(3)	(4)	(5)
Exploit new business opportunities by identifying the unmet needs of the current customer.	(1)	(2)	(3)	(4)	(5)
Identify emerging customer needs to develop a new product/service.	(1)	(2)	(3)	(4)	(5)
Redesign the existing products and delivery system to meet the identified needs of the new market segment.	(1)	(2)	(3)	(4)	(5)
Develop a new product that addresses latent needs.	(1)	(2)	(3)	(4)	(5)
Identify and use skills that are necessary to create new business models.	(1)	(2)	(3)	(4)	(5)
Create a new business model that is totally different from our main competitors'. (e.g., New ways of making products, delivering products/services, and making money by doing so.)	(1)	(2)	(3)	(4)	(5)

P.17: Technology capabilities.

Q8: Companies develop new products to take them up against their competitors. Different companies have different capabilities to help them achieve this goal. In the following list, we summarise some of such capabilities.

Please indicate which of these capabilities you have by using a 5-point scale (1= "Never" to 5= "Constantly").

(It shall take you about 2 minutes to answer this question.)

"To ensure our newly developed product is competitive, we…"	Never	Rarely	Sometimes	Frequently	Constantly
Product innovation capability.					
Exploit the newest available technologies.	(1)	(2)	(3)	(4)	(5)
Expand the product portfolio.	(1)	(2)	(3)	(4)	(5)
Improve existing product quality.	(1)	(2)	(3)	(4)	(5)
Improve production flexibility.	(1)	(2)	(3)	(4)	(5)
Process innovation capability.					
Create and manage an internal portfolio of interrelated technologies.	(1)	(2)	(3)	(4)	(5)
Master and absorb the basic and key technologies in the industry.	(1)	(2)	(3)	(4)	(5)
Develop programs to reduce production costs.	(1)	(2)	(3)	(4)	(5)
Have valuable knowledge for innovating manufacturing and technological processes.	(1)	(2)	(3)	(4)	(5)
Have valuable knowledge on the best processes and systems of the organisation.	(1)	(2)	(3)	(4)	(5)
Organise our production process more efficiently to make it better utilise the resources than it used to be.	(1)	(2)	(3)	(4)	(5)
Allocate resources to the production department efficiently to improve our production performance (e.g., quality improvement, cost reduction).	(1)	(2)	(3)	(4)	(5)
Offer environmentally friendly production processes.	(1)	(2)	(3)	(4)	(5)
Manage our production organisation more efficiently to secure the quality and cost of our new product.	(1)	(2)	(3)	(4)	(5)
Integrate our production activities to achieve better production efficiency than previously.	(1)	(2)	(3)	(4)	(5)
R & D capability.					
Obtain high quality and quick feedback from manufacturing to design and engineer our new products.	(1)	(2)	(3)	(4)	(5)
Possess good mechanisms for transferring technology from research to our product design.	(1)	(2)	(3)	(4)	(5)
Obtain a great extent of market and customer feedback and apply it to our new product/process development.	(1)	(2)	(3)	(4)	(5)
Manufacturing capability.					

Enable our manufacturing department to transform the R&D output into our production.	(1)	(2)	(3)	(4)	(5)
Effectively apply advanced manufacturing methods.	(1)	(2)	(3)	(4)	(5)
Have capable (e.g., trained and skilled) manufacturing personnel to run production lines.	(1)	(2)	(3)	(4)	(5)

P.18: Marketing and Management capabilities.

Q9:

In order to remain competitive, different companies have different capabilities seek to differentiate themselves from rivals. The below list gives you some of such capabilities.

Please indicate which of these capabilities you have by using a 5-point scale (1= "Never to 5= "Constantly).

(It shall take you about 2 minutes to answer this question.)

"To keep our new product stay competitively, we…"	Never	Rarely	Sometimes	Frequently	Constantly
Marketing capability.					
Build a closer relationship with our major customers than what our competitors have with theirs.	(1)	(2)	(3)	(4)	(5)
Obtain good knowledge of different market segments to better understand customers` needs than our competitors do.	(1)	(2)	(3)	(4)	(5)
Build a sales-force that efficiently utilises resources on selling products than our competitors' sales-force.	(1)	(2)	(3)	(4)	(5)
Provide excellent after-sale services to our customers; far better than what our competitors can offer.	(1)	(2)	(3)	(4)	(5)
Learning capability.					
Better identify opportunities for product development/businesses improvement than previously.	(1)	(2)	(3)	(4)	(5)
Adopt accessed knowledge into daily activities for improving our work performance.	(1)	(2)	(3)	(4)	(5)
Knowledge sharing capability.					
Share our work reports and official documents with other companies.	(1)	(2)	(3)	(4)	(5)
Share our manuals and methodologies with other companies.	(1)	(2)	(3)	(4)	(5)

Share our know-how/experiences with other companies.	(1)	(2)	(3)	(4)	(5)
Resources allocation capability.					
We attach the importance of possessing and deploying human resources (e.g., employee assets).	(1)	(2)	(3)	(4)	(5)
Plan and arrange human resources to meet the need of different phases of our new product/process development.	(1)	(2)	(3)	(4)	(5)
Select key personnel from different functional departments then assign them to our new product/process project.	(1)	(2)	(3)	(4)	(5)
Provide steady capital to support the activities of our new product/process development.	(1)	(2)	(3)	(4)	(5)
Collaborative capability.					
Work with our business stakeholders (e.g., suppliers, manufacturers, and distributors) to introduce our new product/service to the market.	(1)	(2)	(3)	(4)	(5)
Interact with our business stakeholders to generate new ideas in the process of problem-solving.	(1)	(2)	(3)	(4)	(5)
Provide additional services to our customers by collaborating with our main business stakeholders.	(1)	(2)	(3)	(4)	(5)
Work with our business stakeholders to launch new functionalities for the existing products.	(1)	(2)	(3)	(4)	(5)
Work with our business stakeholders to implement our new marketing strategy.	(1)	(2)	(3)	(4)	(5)
Develop new skills to improve the collaboration with our business stakeholders.	(1)	(2)	(3)	(4)	(5)
Design a new collaborative business process to work with our business stakeholders better than previously.	(1)	(2)	(3)	(4)	(5)

P19. The needed Resources
Q10:

Companies need to possess resources for developing and delivering new products. Different configurations of resources will lead to various outcomes. A summary of these resources follows.

From your own experiences, can you indicate how important/critical each of the following resources was? Answer with a 5-point scale. (1=" Totally not critical" to 5=" Totally critical.")

(It shall take you about 2 minutes to complete.)

"In the process of developing and delivering the new product, what was needed was…"	Totally not critical	Not critical	Neither critical or not critical	critical	Totally critical
Physical resources.					
Buildings.	(1)	(2)	(3)	(4)	(5)
Location of buildings.	(1)	(2)	(3)	(4)	(5)
Physical structure.	(1)	(2)	(3)	(4)	(5)
Machinery.	(1)	(2)	(3)	(4)	(5)
Financial resources.					
Financial capital.	(1)	(2)	(3)	(4)	(5)
Financial investment.	(1)	(2)	(3)	(4)	(5)
Cash from the operation.	(1)	(2)	(3)	(4)	(5)
Human intelligent resources. (Entrepreneurial Orientation)					
EO-innovativeness	(1)	(2)	(3)	(4)	(5)
EO-proactiveness.	(1)	(2)	(3)	(4)	(5)
EO-risk seeking.	(1)	(2)	(3)	(4)	(5)
Reputational resources.					
Company reputation.	(1)	(2)	(3)	(4)	(5)
Customer service reputation.	(1)	(2)	(3)	(4)	(5)
Product reputation.	(1)	(2)	(3)	(4)	(5)
Technological resources.					
Held in secret technology.	(1)	(2)	(3)	(4)	(5)
New/improved product design.	(1)	(2)	(3)	(4)	(5)
Unique technological know-how.	(1)	(2)	(3)	(4)	(5)
Human resources.					
Employees` educational background.	(1)	(2)	(3)	(4)	(5)
Employees` specialised area.	(1)	(2)	(3)	(4)	(5)
Employees` workforce capability.	(1)	(2)	(3)	(4)	(5)
Employees` working experience length (years) in the required field/industry.	(1)	(2)	(3)	(4)	(5)
Networking alliance resources.					
Closeness centrality: The communication path between us and our partners has fewest intermediate. (e.g., suppliers, consultants, advisors, sub-contractors)	(1)	(2)	(3)	(4)	(5)
Repeated partners: The number of our allies/partners with repeated cooperation increases.	(1)	(2)	(3)	(4)	(5)

P.20***:*** **<u>The Activities.</u>**

~You are now reaching the end of this questionnaire!!~

Q11: To compete with rivals, some companies create low-cost or differentiated products; others focus on offering something to satisfy the specific market/segment needs. Different companies develop/choose and perform different sets of activities to accomplish their goals. There are some given activities listed below.

According to your own experiences of the most recent innovative project, please rate each of the following statements by using the 5-point scale from 1= "Never" to 5= "Constantly."

(It shall take you about 7 minutes to answer this question.)

"In order to successfully develop and deliver the new product to the customers..."	Never	Rarely	Sometimes	Frequently	Constantly
Product innovation activity					
We add the factor of visual complexity while developing the new product appearance.	(1)	(2)	(3)	(4)	(5)
We deploy resources for having our new product priced competitively to competitors' items.	(1)	(2)	(3)	(4)	(5)
We introduced new knowledge to modify the existing product design in the market / manufacturer-related consideration.	(1)	(2)	(3)	(4)	(5)
Process innovation activity.					
We introduced new or significantly improved methods of manufacturing /producing goods.	(1)	(2)	(3)	(4)	(5)
We introduced new or significantly improved logistics, delivery or distribution methods for inputs and goods/services.	(1)	(2)	(3)	(4)	(5)
We introduced new or significantly improved supporting activities to improve our production/delivery process.	(1)	(2)	(3)	(4)	(5)
Exploration innovation activity.					
We acquire technologies that are totally new to our company.	(1)	(2)	(3)	(4)	(5)
We acquire skills that are totally new to our company.	(1)	(2)	(3)	(4)	(5)
We acquire new (up-to-date) technologies that are totally new to our company.	(1)	(2)	(3)	(4)	(5)
We acquire new (up-to-date) innovation skills that are totally new to our company.	(1)	(2)	(3)	(4)	(5)
Exploitative innovation activity.					
We upgrade skills in our innovation activities (e.g., product, process, organisational and marketing innovation) where our company already possesses significant experiences.	(1)	(2)	(3)	(4)	(5)
We strengthen our knowledge and skills regarding our new product/process project	(1)	(2)	(3)	(4)	(5)

that can improve the efficiency of our existing innovation activities.					
We invest in enhancing our skills in exploiting mature technologies that can improve our productivity.	(1)	(2)	(3)	(4)	(5)
Market entry timing activity.					
We research how many competitive products are presented in the same market (or as substitutes) before launching our new product.	(1)	(2)	(3)	(4)	(5)
We choose the particular stage of the product life cycle (e.g., introductory, growth, maturity, or end of the maturity) as the timing to launch our new product/service on the market.	(1)	(2)	(3)	(4)	(5)
We pre-set the duration (in quarters) of time between the decision made to develop the new product and the launch of the new product on the market.	(1)	(2)	(3)	(4)	(5)
Open innovation activity.					
We have customers directly involved in our new product/process development.	(1)	(2)	(3)	(4)	(5)
Our new product/process development are highly dependent upon the contribution of our external partners. (e.g., customers, competitors, research institutes, consultants, suppliers, government, or universities)	(1)	(2)	(3)	(4)	(5)
We buy R&D related product/service from our external partners.	(1)	(2)	(3)	(4)	(5)
We buy intellectual property (e.g., patents, copyrights, or trademarks) from our external partners to be used in our new product/process development.	(1)	(2)	(3)	(4)	(5)
We invest in other firms to access their knowledge or other synergies that are beneficial to our new product/process development.	(1)	(2)	(3)	(4)	(5)
Front-end innovation activity.					
Our technical activity (e.g., technical feasibility demonstration) occurs before we develop or significantly invest in the new product/process.	(1)	(2)	(3)	(4)	(5)
Our product concept development occurs before we develop or significantly invest in the new product/process.	(1)	(2)	(3)	(4)	(5)
Our market research occurs before we develop or significantly invest in the new product/process.	(1)	(2)	(3)	(4)	(5)

Our business case development (e.g., financial viability analysis, business model development, and business plan preparation) occurs before we develop or significantly invest in the new product/process.	(1)	(2)	(3)	(4)	(5)
Marketing innovation activity.					
We make significant changes to the outlook design or packaging of good/service while introducing the new product to the market.	(1)	(2)	(3)	(4)	(5)
We use new media or techniques to promote our new product while it is introduced to the market.	(1)	(2)	(3)	(4)	(5)
We develop new product replacement methods or sales channels while introducing the new product to the market.	(1)	(2)	(3)	(4)	(5)
We develop new methods of pricing good /service while introducing the new product to the market.	(1)	(2)	(3)	(4)	(5)

P.21

Section 5: **Types of innovation performance.**

This is the **FINAL SECTION** of this questionnaire, which attempts to identify the success of the developed innovation.

P.22 Innovation performance types:

Q12: When asked, different managers reported they use different criteria to assess the success of their efforts to develop and launch new products. The list below summarises these criteria.

Please rate each of the following statements by using the 5-point scale; 1= "Totally unimportant" to 5= "Totally Important."

(It shall take you about 2 minutes to answer this question.)

"Criteria for new product performance – success. "We assess EVERY new product we develop and launch based on:"

	Totally Unimportant	Unimportant	Neither Important or Unimportant	Important	Totally Important
The sales revenue in the first 12 months after its launch.	(1)	(2)	(3)	(4)	(5)
The market share in the first 12 months after its launch.	(1)	(2)	(3)	(4)	(5)

The return on investments the new product achieved in the first 12 months after its launch.	(1)	(2)	(3)	(4)	(5)
The actual quality of the new product.	(1)	(2)	(3)	(4)	(5)
How easy it is to manufacture the new product.	(1)	(2)	(3)	(4)	(5)
How innovative the new product is compared to what already exists in the market ("first in the market")?	(1)	(2)	(3)	(4)	(5)
How hard is it for our competitors to imitate our new product?	(1)	(2)	(3)	(4)	(5)
How do customers respond to our new product?	(1)	(2)	(3)	(4)	(5)
How do intermediaries (e.g., distributors, agents) respond to our new product?	(1)	(2)	(3)	(4)	(5)
How well the new product fits with our existing products?	(1)	(2)	(3)	(4)	(5)
How well the new product complements our existing products?	(1)	(2)	(3)	(4)	(5)
How much the new product helps to boost market performance for our existing products?	(1)	(2)	(3)	(4)	(5)
How much the new product changes the existing consumers' habits and behaviours?	(1)	(2)	(3)	(4)	(5)
How much the new product undermines the existing infrastructure used to support the competitors' established success?	(1)	(2)	(3)	(4)	(5)

P.23

Thank you so much for completing all the questions, in the end, we only need to collect some background information of your company.

As we have already promised, this is a fully anonymised survey, and none of the information we collect in this stage would or could be used to identify you or your company.

P.24 Company general information:

- Type of company's field: (Please choose by ticking the "One" column as the most relevant field of your company's business):
  1.( ) Telecommunications, 2.( ) Information technology consulting, 3.( ) Semiconductors, 4.( ) Automation, 5.( ) Medical equipment, 6.( ) Pharmaceutical and biotechnology, 7.( ) Subassembly, 8.( ) Advanced materials, 9.( ) Computer software and hardware, 10.( ) Renewable energy, 11. ( ) Others_____
- Region: 1. ( ) UK, 2. ( ) Europe, 3. ( ) U.S, 4. ( ) Taiwan, 5.( ) China, 6.( ) Others_____
- Number of employees: 1. ( ) 5~50, 2. ( ) 51~200, 3. ( ) 201~500, 4. ( ) above 500
- Job title in the company: 1. ( ) President, 2. ( ) General Manager, 3. ( ) C-level executive: e.g. CEO, COO, CMO, 4. ( ) Company owner/Entrepreneur, 5. ( ) Department head.
- Years of work at the company: 1. ( ) 1~3, 2. ( ) 3~5, 3. ( ) 5~7, 4. ( ) 7~10, 5. ( ) Above 10.

P.25

~~This is the End of this survey~~

We are TOTALLY grateful for your participation.

If you have any questions or comments, please feel free to contact the Principal Investigator of this study; Howard.C,H.Chou, SBS, chiahao.chou@strath.ac.uk.

Thank you very much for your kind help!

P.20 : End

This is the End of this survey

We are TOTALLY grateful for your participation

If you have any questions or comments pls feel
free to contact the Principal Investigator of this study
Howard.C,H.Chou, SBS
Chiahao.chou@strath.ac.uk

~~~Thank you very much for your kind help~~~
~~~

Appendix D Descriptive statistic of individual item

Items	N	Mean	SD
LOC	228	4.1831	.55449
LRT	228	4.3582	.53361
TOR	228	3.9927	.71789
SPE	228	3.8947	.77679
FOR	228	3.7003	.90376
DEC	228	4.0395	.65847
CAP	228	4.1053	.61601
TEC	228	4.1652	.67215
PAR	228	4.0077	.68832
PRO	228	4.1827	.59137
OFF	228	4.2032	.62273
MAR	228	4.1462	.70664
NCR	228	4.1930	.68014
CHA	228	3.8406	.83806
REV	228	3.9353	.72513
COS	228	4.1667	.68656
SPC	228	4.0184	.63898
SIC	228	3.8357	.66056
PIC	228	4.0121	.61918
PRC	228	3.9829	.58627
RDC	228	3.9985	.69365
MAC	228	3.9181	.73585
MKC	228	4.0066	.60828
LEC	228	3.9978	.72934
KSC	228	3.0015	1.22364
RAC	228	3.8651	.70684
COC	228	3.9511	.62157
PHR	228	3.3136	1.01926
FIR	228	3.9693	.88194
HIR	228	4.1126	.79308
RER	228	4.2500	.75547
TER	228	4.1401	.71999
HUR	228	3.9572	.62491
NAR	228	3.8004	.83605
PIA	228	3.6696	.71279
PRA	228	3.6564	.80951
EIA	228	3.7697	.77662

EXA	228	3.8757	.69164
MEA	228	3.8538	.79034
OIA	228	3.4465	.88578
FEA	228	3.7862	.76440
MIA	228	3.6393	.83499
INP	228	4.0990	.50898
N (listwise)	228		

Appendix E Independent sample T-test report

Independent sample t test										
		Levene equality of variance test		t-test for equality of means						
		F	Significance	T	df	significance（two-tails）	average difference	standard error	Confidence Interval for 95% Difference Number	
									Low limit	upper limit
SPC	equal variance used	5.047	.026	.433	226	.665	.03886	.08964	-.13778	.21549
	Equal variance is not used			.406	129.131	.685	.03886	.09562	-.15033	.22805
SIC	equal variance used	.046	.830	2.683	224	.008	.24647	.09186	.06544	.42750
	Equal variance is not used			2.642	147.344	.009	.24647	.09330	.06208	.43085
PIC	equal variance used	.268	.605	2.008	226	.046	.17298	.08613	.00325	.34271
	Equal variance is not used			2.005	152.396	.047	.17298	.08628	.00252	.34344
PRC	equal variance	.024	.878	1.610	222	.109	.13389	.08318	-.03003	.29781

	used									
	Equal variance is not used			1.619	153.863	.107	.13389	.08269	-.02947	.29725
RDC	equal variance used	.906	.342	1.922	225	.056	.18682	.09720	-.00470	.37835
	Equal variance is not used			1.883	142.402	.062	.18682	.09922	-.00932	.38297
MAC	equal variance used	.314	.576	2.169	226	.031	.22167	.10221	.02025	.42308
	Equal variance is not used			2.249	169.142	.026	.22167	.09854	.02714	.41620
MKC	equal variance used	3.280	.071	1.733	226	.085	.14694	.08481	-.02017	.31405
	Equal variance is not used			1.646	133.495	.102	.14694	.08930	-.02968	.32356
LEC	equal variance used	1.186	.277	2.063	226	.040	.20921	.10141	.00939	.40904
	Equal variance is not used			2.009	142.464	.046	.20921	.10416	.00331	.41511

KSC	equal variance used	.260	.610	2.062	226	.040	.35076	.17014	.01550	.68602
	Equal variance is not used			2.034	147.597	.044	.35076	.17246	.00996	.69157
RAC	equal variance used	1.341	.248	.819	226	.414	.08108	.09905	-.11410	.27627
	Equal variance is not used			.778	133.773	.438	.08108	.10422	-.12504	.28721
COC	equal variance used	.000	.992	2.053	226	.041	.17744	.08643	.00713	.34776
	Equal variance is not used			2.059	154.366	.041	.17744	.08617	.00722	.34767

Appendix F OLAP multidimension report

OLAP multidimension report							
To answer, please reflect on your "Most recent new product" and choose by ticking the "ONE" colum... - Innovation type and extent - Most recent new product		(Total)	N	(Mean)	(SD)	(Kurtosis)	(Skewness)
LOC	Radical	325.25	77	4.2240	.60641	3.166	-1.256
	Incremental	628.50	151	4.1623	.52694	.304	-.562
	Total	953.75	228	4.1831	.55449	1.512	-.836
LRT	Radical	340.67	77	4.4242	.52881	3.266	-1.398
	Incremental	653.00	151	4.3245	.53465	.710	-.801
	Total	993.67	228	4.3582	.53361	1.352	-.981
TOR	Radical	318.33	77	4.1342	.74978	.525	-.891
	Incremental	592.00	151	3.9205	.69251	.748	-.626
	總計	910.33	228	3.9927	.71789	.498	-.671
SPE	Radical	313.50	77	4.0714	.70110	-.791	-.379
	Incremental	574.50	151	3.8046	.79994	-.268	-.399
	Total	888.00	228	3.8947	.77679	-.304	-.434
FOR	Radical	293.67	77	3.8139	.98896	-.425	-.683
	Incremental	550.00	151	3.6424	.85470	.378	-.584
	Total	843.67	228	3.7003	.90376	-.030	-.581
DEC	Radical	317.33	77	4.1212	.69860	4.301	-1.388
	Incremental	603.67	151	3.9978	.63537	.850	-.587
	Total	921.00	228	4.0395	.65847	2.023	-.868
CAP	Radical	325.67	77	4.2294	.64268	.527	-.911
	Incremental	610.33	151	4.0419	.59417	.163	-.307
	Total	936.00	228	4.1053	.61601	.081	-.488
TEC	Radical	330.00	77	4.2857	.57153	1.147	-.930
	Incremental	619.67	151	4.1038	.71200	3.729	-1.333
	Total	949.67	228	4.1652	.67215	3.579	-1.303
PAR	Radical	317.00	77	4.1169	.72727	1.642	-1.082
	Incremental	596.75	151	3.9520	.66315	.092	-.546
	Total	913.75	228	4.0077	.68832	.534	-.711
PRO	Radical	330.00	77	4.2857	.61823	-.646	-.522
	Incremental	623.67	151	4.1302	.57216	.203	-.529
	Total	953.67	228	4.1827	.59137	-.162	-.484

OFF	Radical	324.67	77	4.2165	.65509	-.272	-.507
	Incremental	633.67	151	4.1965	.60769	.631	-.704
	Total	958.33	228	4.2032	.62273	.255	-.621
MAR	Radical	331.33	77	4.3030	.65602	1.042	-1.040
	Incremental	614.00	151	4.0662	.72010	2.662	-1.286
	Total	945.33	228	4.1462	.70664	2.274	-1.207
NCR	Radical	323.00	77	4.1948	.72618	.707	-.873
	Incremental	633.00	151	4.1921	.65793	1.437	-.901
	Total	956.00	228	4.1930	.68014	1.108	-.885
CHA	Radical	312.67	77	4.0606	.70031	-.798	-.273
	Incremental	563.00	151	3.7285	.88142	.378	-.605
	Total	875.67	228	3.8406	.83806	.441	-.621
REV	Radical	311.25	77	4.0422	.67790	.048	-.569
	Incremental	586.00	151	3.8808	.74433	.398	-.682
	Total	897.25	228	3.9353	.72513	.353	-.666
COS	Radical	327.00	77	4.2468	.71819	1.113	-1.104
	Incremental	623.00	151	4.1258	.66860	.565	-.772
	Total	950.00	228	4.1667	.68656	.657	-.868
SPC	Radical	311.40	77	4.0442	.72448	-.317	-.683
	Incremental	604.80	151	4.0053	.59282	-.048	-.196
	Total	916.20	228	4.0184	.63898	-.152	-.413
SIC	Radical	307.86	77	3.9981	.67554	-.012	-.552
	Incremental	559.00	149	3.7517	.64348	.050	-.035
	Total	866.86	226	3.8357	.66349	-.173	-.188
PIC	Radical	317.75	77	4.1266	.61722	-.779	-.234
	Incremental	597.00	151	3.9536	.61401	-.071	-.117
	Total	914.75	228	4.0121	.61918	-.343	-.149
PRC	Radical	309.40	76	4.0711	.58237	-.904	-.210
	Incremental	582.70	148	3.9372	.59296	-.379	-.182
	Total	892.10	224	3.9826	.59150	-.547	-.192
RDC	Radical	313.33	76	4.1228	.71976	-.455	-.615
	Incremental	594.33	151	3.9360	.67628	-.031	-.468
	Total	907.67	227	3.9985	.69518	-.255	-.484
MAC	Radical	313.00	77	4.0649	.67547	-.649	-.419
	Incremental	580.33	151	3.8433	.75602	1.458	-.854
	Total	893.33	228	3.9181	.73585	1.080	-.758
MKC	Radical	316.00	77	4.1039	.66929	.095	-.675
	Incremental	597.50	151	3.9570	.57064	-.612	.004
	Total	913.50	228	4.0066	.60828	-.411	-.240
LEC	Radical	318.50	77	4.1364	.76363	.017	-.681

	Incremental	593.00	151	3.9272	.70332	-.556	-.203
	Total	911.50	228	3.9978	.72934	-.464	-.345
KSC	Radical	249.00	77	3.2338	1.24847	-1.042	-.230
	Incremental	435.33	151	2.8830	1.19765	-1.034	.114
	Total	684.33	228	3.0015	1.22364	-1.087	.006
RAC	Radical	301.75	77	3.9188	.78056	.413	-.808
	Incremental	579.50	151	3.8377	.66721	-.169	-.347
	Total	881.25	228	3.8651	.70684	.066	-.525
COC	Radical	313.29	77	4.0686	.61341	.554	-.599
	Incremental	587.57	151	3.8912	.61913	.336	-.147
	Total	900.86	228	3.9511	.62157	.249	-.288
PHR	Radical	269.50	77	3.5000	1.10322	-.358	-.657
	Incremental	486.00	151	3.2185	.96363	-.329	-.262
	Total	755.50	228	3.3136	1.01926	-.448	-.368
FIR	Radical	314.00	77	4.0779	.88671	.616	-1.059
	Incremental	591.00	151	3.9139	.87725	1.298	-1.034
	Total	905.00	228	3.9693	.88194	.996	-1.021
HIR	Radical	324.67	77	4.2165	.79613	.651	-1.082
	Incremental	613.00	151	4.0596	.78889	1.020	-.819
	Total	937.67	228	4.1126	.79308	.788	-.888
RER	Radical	326.00	76	4.2895	.81348	2.400	-1.482
	Incremental	626.00	148	4.2297	.73653	2.293	-1.221
	Total	952.00	224	4.2500	.76221	2.242	-1.308
TER	Radical	326.33	77	4.2381	.73520	1.514	-1.137
	Incremental	609.33	149	4.0895	.71411	.744	-.781
	Total	935.67	226	4.1401	.72318	.875	-.881
HUR	Radical	312.00	77	4.0519	.69578	1.351	-.852
	Incremental	590.25	151	3.9089	.58201	2.057	-.639
	Total	902.25	228	3.9572	.62491	1.602	-.669
NAR	Radical	302.00	77	3.9221	.79912	.739	-.989
	Incremental	564.50	151	3.7384	.85017	.227	-.545
	Total	866.50	228	3.8004	.83605	.285	-.679
PIA	Radical	296.67	77	3.8528	.76757	-.554	-.389
	Incremental	540.00	151	3.5762	.66659	.338	.056
	Total	836.67	228	3.6696	.71279	-.211	-.052
PRA	Radical	300.00	77	3.8961	.76903	.582	-.703
	Incremental	533.67	151	3.5342	.80469	.344	-.368
	Total	833.67	228	3.6564	.80951	.251	-.457
EIA	Radical	311.50	77	4.0455	.72403	-.369	-.520
	Incremental	548.00	151	3.6291	.76695	.041	-.365

	Total	859.50	228	3.7697	.77662	-.124	-.399
EXA	Radical	317.33	77	4.1212	.69018	-.504	-.467
	Incremental	566.33	151	3.7506	.66021	.428	-.152
	Total	883.67	228	3.8757	.69164	-.098	-.200
MEA	Radical	307.00	77	3.9870	.77694	-.651	-.438
	Incremental	571.67	151	3.7859	.79101	.577	-.635
	Total	878.67	228	3.8538	.79034	.212	-.561
OIA	Radical	284.00	77	3.6883	.86663	.432	-.671
	Incremental	501.80	151	3.3232	.87265	-.604	-.044
	Total	785.80	228	3.4465	.88578	-.485	-.235
FEA	Radical	305.25	77	3.9643	.71141	.210	-.509
	Incremental	558.00	151	3.6954	.77669	.245	-.488
	Total	863.25	228	3.7862	.76440	.243	-.510
MIA	Radical	299.75	77	3.8929	.77526	.485	-.791
	Incremental	530.00	151	3.5099	.83710	.072	-.343
	Total	829.75	228	3.6393	.83499	.026	-.474
INP	Radical	326.79	77	4.2440	.52083	.071	-.654
	Incremental	607.79	151	4.0251	.48817	-.447	.128
	Total	934.57	228	4.0990	.50898	-.540	-.116

Appendix G Correlation analysis

		SPC	SIC	PIC	PRC	RDC	MAC	MKC	LEC	KSC	RAC	COC	PHR	FIR	HIR	RER	TER	HUR	NAR	PIA
SPC	Pes	1	.781**	.613**	.736**	.672**	.583**	.646**	.577**	.224**	.658**	.656**	.248**	.263**	.336**	.327**	.317**	.302**	.363**	.448**
	Sig		.000	.000	.000	.000	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
SIC	Pes	.781**	1	.670**	.742**	.708**	.650**	.686**	.618**	.371**	.707**	.776**	.332**	.284**	.363**	.373**	.342**	.341**	.424**	.551**
	Sig	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	226	226	226	223	225	226	226	226	226	226	226	226	226	226	222	224	226	226	226
PIC	Pes	.613**	.670**	1	.784**	.648**	.598**	.580**	.587**	.220**	.616**	.612**	.325**	.348**	.362**	.367**	.404**	.349**	.434**	.551**
	Sig	.000	.000		.000	.000	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
PRC	Pes	.736**	.742**	.784**	1	.757**	.702**	.638**	.643**	.310**	.710**	.672**	.432**	.333**	.330**	.368**	.349**	.373**	.411**	.540**
	Sig	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	224	223	224	224	223	224	224	224	224	224	224	224	224	224	220	222	224	224	224
RDC	Pes	.672**	.708**	.648**	.757**	1	.704**	.674**	.685**	.270**	.599**	.708**	.306**	.241**	.362**	.367**	.440**	.370**	.384**	.535**
	Sig	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	227	225	227	223	227	227	227	227	227	227	227	227	227	227	223	225	227	227	227
MAC	Pes	.583**	.650**	.598**	.702**	.704**	1	.558**	.591**	.342**	.618**	.627**	.343**	.268**	.272**	.298**	.368**	.334**	.328**	.472**
	Sig	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
MKC	Pes	.646**	.686**	.580**	.638**	.674**	.558**	1	.674**	.258**	.634**	.642**	.268**	.203**	.226**	.290**	.324**	.304**	.303**	.462**

	Sig	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.002	.001	.000	.000	.000	.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
LEC	Pes	.577**	.618**	.587**	.643**	.685**	.591**	.674**	1	.250**	.642**	.611**	.261**	.159*	.267**	.289**	.390**	.333**	.303**	.386**
	Sig	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.017	.000	.000	.000	.000	.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
KSC	Pes	.224**	.371**	.220**	.310**	.270**	.342**	.258**	.250**	1	.318**	.287**	.346**	.127	.061	-.014	.031	.187**	.230**	.290**
	Sig	.001	.000	.001	.000	.000	.000	.000	.000		.000	.000	.000	.055	.356	.829	.645	.005	.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
RAC	Pes	.658**	.707**	.616**	.710**	.599**	.618**	.634**	.642**	.318**	1	.643**	.262**	.267**	.240**	.297**	.332**	.303**	.244**	.386**
	Sig	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
COC	Pes	.656**	.776**	.612**	.672**	.708**	.627**	.642**	.611**	.287**	.643**	1	.257**	.225**	.356**	.286**	.408**	.336**	.429**	.457**
	Sig	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.001	.000	.000	.000	.000	.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
PHR	Pes	.248**	.332**	.325**	.432**	.306**	.343**	.268**	.261**	.346**	.262**	.257**	1	.538**	.247**	.310**	.264**	.506**	.414**	.432**
	Sig	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
FIR	Pes	.263**	.284**	.348**	.333**	.241**	.268**	.203**	.159*	.127	.267**	.225**	.538**	1	.527**	.420**	.532**	.452**	.440**	.269**
	Sig	.000	.000	.000	.000	.000	.000	.002	.017	.055	.000	.001	.000		.000	.000	.000	.000	.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
HIR	Pes	.336**	.363**	.362**	.330**	.362**	.272**	.226**	.267**	.061	.240**	.356**	.247**	.527**	1	.489**	.636**	.474**	.539**	.264**
	Sig	.000	.000	.000	.000	.000	.000	.001	.000	.356	.000	.000	.000	.000		.000	.000	.000	.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228

RER	Pes	.327**	.373**	.367**	.368**	.367**	.298**	.290**	.289**	-.014	.297**	.286**	.310**	.420**	.489**	1	.550**	.572**	.530**	.266**
	Sig	.000	.000	.000	.000	.000	.000	.000	.000	.829	.000	.000	.000	.000	.000		.000	.000	.000	.000
	N	224	222	224	220	223	224	224	224	224	224	224	224	224	224	224	224	224	224	224
TER	Pes	.317**	.342**	.404**	.349**	.440**	.368**	.324**	.390**	.031	.332**	.408**	.264**	.532**	.636**	.550**	1	.578**	.507**	.281**
	Sig	.000	.000	.000	.000	.000	.000	.000	.000	.645	.000	.000	.000	.000	.000	.000		.000	.000	.000
	N	226	224	226	222	225	226	226	226	226	226	226	226	226	226	224	226	226	226	226
HUR	Pes	.302**	.341**	.349**	.373**	.370**	.334**	.304**	.333**	.187**	.303**	.336**	.506**	.452**	.474**	.572**	.578**	1	.515**	.389**
	Sig	.000	.000	.000	.000	.000	.000	.000	.000	.005	.000	.000	.000	.000	.000	.000	.000		.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
NAR	Pes	.363**	.424**	.434**	.411**	.384**	.328**	.303**	.303**	.230**	.244**	.429**	.414**	.440**	.539**	.530**	.507**	.515**	1	.336**
	Sig	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
PIA	Pes	.448**	.551**	.551**	.540**	.535**	.472**	.462**	.386**	.290**	.386**	.457**	.432**	.269**	.264**	.266**	.281**	.389**	.336**	1
	Sig	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
PRA	Pes	.477**	.622**	.550**	.582**	.498**	.571**	.479**	.438**	.345**	.485**	.486**	.516**	.361**	.337**	.333**	.279**	.436**	.433**	.674**
	Sig	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
EIA	Pes	.407**	.530**	.491**	.441**	.446**	.507**	.369**	.398**	.395**	.400**	.523**	.395**	.344**	.334**	.181**	.355**	.365**	.333**	.516**
	Sig	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.007	.000	.000	.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
EXA	Pes	.611**	.638**	.619**	.717**	.611**	.567**	.546**	.589**	.236**	.544**	.620**	.405**	.301**	.340**	.363**	.357**	.446**	.392**	.583**

	Sig	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
MEA	Pes	.601**	.639**	.586**	.626**	.584**	.510**	.524**	.440**	.242**	.517**	.588**	.383**	.358**	.410**	.351**	.331**	.404**	.401**	.612**
	Sig	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
OIA	Pes	.323**	.498**	.401**	.475**	.431**	.370**	.414**	.315**	.570**	.306**	.442**	.463**	.180**	.169*	.025	.083	.287**	.324**	.478**
	Sig	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.006	.011	.709	.213	.000	.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
FEA	Pes	.607**	.644**	.620**	.681**	.607**	.582**	.545**	.541**	.275**	.546**	.585**	.413**	.278**	.387**	.398**	.330**	.425**	.465**	.539**
	Sig	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228
MIA	Pes	.517**	.702**	.588**	.573**	.536**	.495**	.502**	.446**	.340**	.509**	.562**	.468**	.284**	.277**	.336**	.159*	.348**	.328**	.611**
	Sig	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.017	.000	.000	.000
	N	228	226	228	224	227	228	228	228	228	228	228	228	228	228	224	226	228	228	228

Appendix H Examination of PLS-SEM Model

1. NMPBM (whole) PLS-SEM Examination

Hypothesis	Path	Path coefficieies	T Statistics (IO/STDEVI)	P Values	Hypothesis	R square	f square	q square	95% CILL	95% CIUL	Fitniews
H1	Capabilities -> MNPBM	0.388	7.466	0.000	Accepted	0.725	0.230	0.066	0.288	0.488	SRMR=0.110
H2	Resources -> MNPBM	0.058	1.184	0.236	Not accepted	0.725	0.007	0.002	(0.033)	0.154	NFI=0.533
H3	Activities -> MNPBM	0.223	3.481	0.000	Accepted	0.725	0.073	0.429	0.102	0.356	RMS_Theta=0.215
H4	Business _model -> Inno_Performance	0.615	10.927	0.000	Accepted	0.379	0.609	0.154	0.480	0.707	
H5	Org_Culture -> MNPBM	0.322	5.651	0.000	Accepted	0.725	0.202	0.063	0.207	0.427	
H6	Business _model -> Org_Structure	0.433	6.277	0.000	Accepted	0.554	0.201	0.059	0.292	0.556	
H7	Org_Culture -> Org_Structure	0.369	5.803	0.000	Accepted	0.554	0.147	0.054	0.252	0.496	

2. CRBM (whole) PLS-SEM Examination

Hypothesis	Path	Path coefficieies	T Statistics (IO/STDEVI)	P Values	Hypothesis	R square	f square	q square	95% CILL	95% CIUL	Fitniews
H1	Capabilities -> CRBM	0.325	4.545	0.000	Accepted	0.641	0.120	(0.002)	0.187	0.467	SRMR=0.121
H2	Resources -> CRBM	0.040	0.758	0.448	Not accepted	0.641	0.003	0.002	(0.052)	0.145	NFI=0.477
H3	Activities -> CRBM	0.106	1.253	0.210	Not accepted	0.641	0.012	(0.002)	(0.063)	0.260	RMS_Theta=0.239
H4	CRBM -> Inno_Performance	0.596	11.105	0.000	Accepted	0.355	0.551	0.002	0.556	0.721	
H5	Org_Culture -> CRBM	0.449	6.017	0.000	Accepted	0.641	0.305	0.135	0.296	0.591	
H6	CRBM -> Org_Structure	0.438	5.856	0.000	Accepted	0.553	0.199	0.049	0.271	0.575	
H7	Org_Culture -> Org_Structure	0.361	5.206	0.000	Accepted	0.553	0.136	0.049	0.227	0.503	

3. NPDBM (whole) PLS-SEM Examination

Hypothesis	Path	Path coefficieies	T Statistics (IO/STDEVI)	P Values	Hypothesis	R square	f square	q square	95% CILL	95% CIUL	Fitniews
H1	Capabilities -> NPDBM	0.361	4.836	0.000	Accepted	0.667	0.123	0.439	0.219	0.508	SRMR=0.119
H2	Resources -> NPDBM	0.141	2.801	0.027	Accepted	0.667	0.044	0.013	0.048	0.247	NFI=0.479
H3	Activities ->NPDBM	(0.022)	0.332	0.470	Not accepted	0.667	0.001	0.000	(0.151)	0.101	RMS_Theta=0.235
H4	NPDBM -> Inno_Performance	0.643	15.843	0.000	Accepted	0.413	0.705	0.065	0.550	0.711	
H5	Org_Culture -> NPDBM	0.452	7.390	0.000	Accepted	0.667	0.285	0.114	0.336	0.570	
H6	NPDBM -> Org_Structure	0.232	2.791	0.005	Accepted	0.498	0.045	0.212	0.063	0.389	
H7	Org_Culture -> Org_Structure	0.512	6.586	0.000	Accepted	0.498	0.218	0.091	0.359	0.659	

4. NMPBM (radical) PLS-SEM Examination

Hypothesis	Path	Path coefficieies	T Statistics (lO/STDEVl)	P Values	Hypothesis	R square	f square	q square	95% CILL	95% CIUL	Fitniews
H1	Capabilities -> NMPBM	0.386	3.491	0.000	Accepted	0.751	0.200	0.043	0.163	0.617	SRMR=0.131
H2	Resources -> NMPBM	0.163	2.114	0.035	Accepted	0.751	0.060	0.016	0.024	0.321	NFI=0.429
H3	Activities -> NMPBM	0.173	1.514	0.130	Not accepted	0.751	0.040	0.007	(0.071)	0.367	RMS_Theta=0.247
H4	NMPBM -> Inno_Performance	0.758	16.025	0.000	Accepted	0.575	1.354	0.000	0.637	0.834	
H5	Org_Culture -> NMPBM	0.288	3.434	0.001	Accepted	0.751	0.146	0.030	0.108	0.441	
H6	NMPBM-> Org_Structure	0.485	3.665	0.000	Accepted	0.565	0.238	0.040	0.203	0.730	
H7	Org_Culture -> Org_Structure	0.323	2.383	0.017	Accepted	0.565	0.106	0.010	0.054	0.586	

5.NMPBM (incremental) PLS-SEM Examination

Hypothesis	Path	Path coefficieies	T Statistics (lO/STDEVl)	P Values	Hypothesis	R square	f square	q square	95% CILL	95% CIUL	Fitniews
H1	Capabilities -> NMPBM	0.521	7.029	0.000	Accepted	0.725	0.463	0.135	0.370	0.661	SRMR=0.101
H2	Resources -> NMPBM	0.000	0.001	0.978	Not accepted	0.725	0.000	0.004	(0.106)	0.121	NFI=0.621
H3	Activities -> NMPBM	0.125	1.853	0.024	Not accepted	0.725	0.033	0.009	(0.003)	0.262	RMS_Theta=0.207
H4	NMPBM -> Inno_Performance	0.566	7.155	0.000	Accepted	0.320	0.471	0.000	0.386	0.696	
H5	Org_Culture -> NMPBM	0.327	4.164	0.002	Accepted	0.725	0.212	0.057	0.183	0.487	
H6	NMPBM -> Org_Structure	0.406	4.853	0.000	Accepted	0.542	0.181	0.054	0.225	0.555	
H7	Org_Culture -> Org_Structure	0.391	5.367	0.000	Accepted	0.542	0.167	0.054	0.255	0.541	

6.CRBM (radical) PLS-SEM Examination

Hypothesis	Path	Path coefficieies	T Statistics (lO/STDEVl)	P Values	Hypothesis	R square	f square	q square	95% CILL	95% CIUL	Fitniews
H1	Capabilities -> CRBM	0.354	3.367	0.001	Accepted	0.768	0.156	0.048	0.168	0.583	SRMR=0.116
H2	Resources -> CRBM	0.057	0.693	0.488	Not accepted	0.768	0.008	(0.002)	(0.075)	0.238	NFI=0.460
H3	Activities -> CRBM	0.069	0.543	0.587	Not accepted	0.768	0.006	0.002	(0.213)	0.291	RMS_Theta=0.212
H4	CRBM -> Inno_Performance	0.720	12.479	0.000	Accepted	0.518	1.074	0.000	0.561	0.807	
H5	Org_Culture -> CRBM	0.429	4.789	0.000	Accepted	0.768	0.448	0.156	0.276	0.669	
H6	CRBM -> Org_Structure	0.389	2.195	0.028	Accepted	0.515	0.099	0.000	0.031	0.734	
H7	Org_Culture -> Org_Structure	0.362	2.037	0.042	Accepted	0.515	0.086	0.276	(0.006)	0.691	

8.NPDBM (radical) PLS-SEM Examination

Hypothesis	Path	Path coefficieies	T Statistics (lO/STDEVl)	P Values	Hypothesis	R square	f square	q square	95% CILL	95% CIUL	Fitniews
H1	Capabilities -> NPDBM	0.342	2.788	0.005	Accepted	0.696	0.124	0.041	0.119	0.580	SRMR=0.143
H2	Resources -> NPDBM	0.156	1.333	0.183	Not accepted	0.696	0.046	0.004	(0.014)	0.417	NFI=0.406
H3	Activities -> NPDBM	(0.134)	0.991	0.322	Not accepted	0.696	0.021	0.081	(0.411)	0.111	RMS_Theta=0.292
H4	NPDBM -> Inno_Performance	0.718	11.265	0.000	Accepted	0.515	1.064	0.001	0.556	0.813	
H5	Org_Culture -> NPDBM	0.552	5.411	0.000	Accepted	0.696	0.421	0.216	0.369	0.774	
H6	NPDBMl -> Org_Structure	0.339	2.005	0.045	Accepted	0.541	0.091	0.038	(0.030)	0.628	
H7	Org_Culture -> Org_Structure	0.435	2.740	0.006	Accepted	0.541	0.149	0.038	0.133	0.753	

7.CRBM (incremental)PLS-SEM Examination

Hypothesis	Path	Path coefficieies	T Statistics (lO/STDEVl)	P Values	Hypothesis	R square	f square	q square	95% CILL	95% CIUL	Fitniews
H1	Capabilities -> Business _model	0.457	3.933	0.000	Accepted	0.621	0.156	0.356	0.245	0.699	SRMR=0.126
H2	Resources -> Business _model	0.029	0.482	0.630	Not accepted	0.621	0.001	0.397	(0.072)	0.254	NFI=0.405
H3	Activities -> Business _model	0.092	1.056	0.291	Not accepted	0.621	0.008	0.395	(0.093)	0.246	RMS_Theta=0.217
H4	Business _model -> Inno_Performance	0.626	11.394	0.000	Accepted	0.392	0.645	0.077	0.492	0.713	
H5	Org_Culture -> Business _model	0.301	2.393	0.003	Accepted	0.621	0.117	0.375	0.116	0.503	
H6	Business _model -> Org_Structure	0.459	5.526	0.000	Accepted	0.576	0.269	0.278	0.275	0.617	
H7	Org_Culture -> Org_Structure	0.368	4.932	0.000	Accepted	0.576	0.172	0.278	0.226	0.520	

9. NPDBM (incremental) PLS-SEM Examination

Hypothesis	Path	Path coefficieies	T Statistics (lO/STDEVl)	P Values	Hypothesis	R square	f square	q square	95% CILL	95% CIUL	Fitniews
H1	Capabilities -> NPDBM	0.386	3.687	0.000	Accepted	0.653	0.124	0.038	0.187	0.593	SRMR=0.118
H2	Resources -> NPDBM	0.132	1.975	0.048	Accepted	0.653	0.035	0.007	0.007	0.271	NFI=0.454
H3	Activities -> NPDBM	0.000	0.003	0.998	Not accepted	0.653	0.000	(0.005)	(0.163)	0.168	RMS_Theta=0.235
H4	NPDBM-> Inno_Performance	0.604	11.163	0.000	Accepted	0.365	0.574	0.182	0.483	0.698	
H5	Org_Culture ->NPDBM	0.407	5.107	0.000	Accepted	0.653	0.236	0.104	0.247	0.561	
H6	NPDBM -> Org_Structure	0.178	1.948	0.051	Not accepted	0.051	0.028	0.103	(0.011)	0.347	
H7	Org_Culture -> Org_Structure	0.552	6.514	0.000	Accepted	0.482	0.267	0.103	0.386	0.714	

10. NMPBM (UK) PLS-SEM Examination

Hypothesis	Path	Path coefficieies	T Statistics (lO/STDEVl)	P Values	Hypothesis	R square	f square	q square	95% CILL	95% CIUL	Fitniews
H1	Capabilities -> Business _model	0.396	4.239	0.000	Accepted	0.834	0.254	0.063	0.247	0.543	SRMR=0.094
H2	Resources -> Business _model	0.103	1.501	0.133	Not accepted	0.834	0.036	0.007	0.000	0.262	NFI=0.630
H3	Activities -> Business _model	0.134	1.321	0.185	Not accepted	0.834	0.032	0.007	(0.054)	0.318	RMS_Theta=0.212
H4	Business _model -> Inno_Performance	0.836	24.211	0.000	Accepted	2.320	2.317	0.000	0.756	0.892	
H5	Org_Culture -> Business _model	0.388	5.377	0.000	Accepted	0.834	0.323	0.084	0.247	0.529	
H6	Business _model -> Org_Structure	0.516	4.770	0.000	Accepted	0.690	0.245	0.043	0.305	0.737	
H7	Org_Culture -> Org_Structure	0.347	3.320	0.001	Accepted	0.690	0.110	0.043	0.131	0.542	

11.NMPBM (TW) Examination

Hypothesis	Path	Path coefficieies	T Statistics (lO/STDEVl)	P Values	Hypothesis	R square	f square	q square	95% CILL	95% CIUL	Fitniews
H1	Capabilities -> NMPBM	0.524	7.512	0.000	Accepted	0.643	0.380	0.102	0.384	0.658	SRMR=0.117
H2	Resources -> NMPBM	0.128	0.750	0.080	Not accepted	0.643	0.031	0.005	0.009	0.226	NFI=0.487
H3	Activities ->NMPBM	0.125	0.564	0.113	Not accepted	0.643	0.026	0.005	0.004	0.286	RMS_Theta=0.212
H4	NMPBM -> Inno_Performance	0.465	4.926	0.000	Accepted	0.217	0.277	0.082	0.000	0.630	
H5	Org_Culture -> NMPBM	0.185	2.306	0.021	Accepted	0.643	0.062	0.016	0.024	0.037	
H6	NMPBM-> Org_Structure	0.315	2.558	0.010	Accepted	0.414	0.114	0.055	0.075	0.543	
H7	Org_Culture -> Org_Structure	0.409	4.043	0.000	Accepted	0.414	0.193	0.056	0.207	0.599	

12.CRBM (UK) PLS-SEM Examination

Hypothesis	Path	Path coefficieies	T Statistics (lO/STDEVl)	P Values	Hypothesis	R square	f square	q square	95% CILL	95% CIUL	Fitniews
H1	Capabilities -> Business _model	0.497	3.734	0.000	Accepted	0.705	0.221	0.098	0.237	0.748	SRMR=0.108
H2	Resources -> Business _model	0.419	0.807	0.984	Not accepted	0.705	0.005	0.000	(0.042)	0.211	NFI=0.574
H3	Activities -> Business _model	(0.055)	0.427	0.670	Not accepted	0.705	0.003	0.098	(0.315)	0.183	RMS_Theta=0.226
H4	Business _model -> Inno_Performance	0.763	18.741	0.000	Accepted	0.582	1.390	0.000	0.658	0.827	
H5	Org_Culture -> Business _model	0.408	3.677	0.000	Accepted	0.705	0.207	0.087	0.196	0.617	
H6	Business _model -> Org_Structure	0.506	4.485	0.000	Accepted	0.712	0.343	0.473	0.268	0.711	
H7	Org_Culture -> Org_Structure	0.387	3.730	0.000	Accepted	0.712	0.200	0.473	0.180	0.594	

13. CRBM (TW) PLS-SEM Examination

Hypothesis	Path	Path coefficieies	T Statistics (lO/STDEVl)	P Values	Hypothesis	R square	f square	q square	95% CILL	95% CIUL	Fitniews
H1	Capabilities -> CRBM	0.163	2.163	0.031	Accepted	0.525	0.044	0.273	0.010	0.305	SRMR=0.120
H2	Resources -> CRBM	0.124	1.596	0.110	Not accepted	0.525	0.023	0.004	(0.032)	0.268	NFI=0.471
H3	Activities -> CRBM	0.217	1.834	0.067	Not accepted	0.525	0.073	-0.077	(0.006)	0.443	RMS_Theta=0.209
H4	CRBM -> Inno_Performance	0.491	7.531	0.000	Accepted	0.241	0.318	0.040	0.320	0.591	
H5	Org_Culture -> CRBM	0.442	4.587	0.000	Accepted	0.525	0.278	0.103	0.228	0.464	
H6	CRBM-> Org_Structure	0.366	3.104	0.002	Accepted	0.421	0.122	0.033	0.126	0.576	
H7	Org_Culture -> Org_Structure	0.349	3.310	0.001	Accepted	0.421	0.122	0.033	0.127	0.541	

14.NPDBM (UK) PLS-SEM Examination

Hypothesis	Path	Path coefficieies	T Statistics (lO/STDEVl)	P Values	Hypothesis	R square	f square	q square	95% CILL	95% CIUL	Fitniews
H1	Capabilities -> Business _model	0.264	2.403	0.016	Accepted	0.745	0.074	0.014	0.073	0.477	SRMR=0.108
H2	Resources -> Business _model	0.052	0.687	0.492	Not accepted	0.745	0.006	(0.012)	(0.051)	0.229	NFI=0.581
H3	Activities -> Business _model	0.094	0.810	0.418	Not accepted	0.745	0.010	0.002	(0.124)	0.308	RMS_Theta=0.233
H4	Business _model -> Inno_Performance	0.794	22.330	0.000	Accepted	0.643	1.706	0.000	0.707	0.852	
H5	Org_Culture -> Business _model	0.533	5.774	0.000	Accepted	0.745	0.398	0.000	0.356	0.711	
H6	Business _model -> Org_Structure	0.330	3.770	0.000	Accepted	0.643	0.095	0.000	0.128	0.486	
H7	Org_Culture -> Org_Structure	0.509	5.916	0.000	Accepted	0.643	0.226	0.107	0.353	0.693	

15.NPDBM (TW) PLS-SEM Examination

Hypothesis	Path	Path coefficieies	T Statistics (lO/STDEVl)	P Values	Hypothesis	R square	f square	q square	95% CILL	95% CIUL	Fitniews
H1	Capabilities -> NPDBM	0.043	0.579	0.562	Accepted	0.476	0.003	(0.014)	(0.093)	0.195	SRMR=0.132
H2	Resources -> NPDBM	0.230	3.026	0.002	Accepted	0.476	0.060	0.030	0.085	0.385	NFI=0.355
H3	Activities ->NPDBM	0.132	1.494	0.135	Not accepted	0.476	0.019	(0.007)	(0.063)	0.282	RMS_Theta=0.247
H4	NPDBM-> Inno_Performance	0.539	8.454	0.000	Accepted	0.291	0.410	0.057	0.368	0.657	
H5	Org_Culture -> NPDBM	0.440	3.947	0.000	Accepted	0.476	0.088	0.000	0.284	0.581	
H6	NPDBM-> Org_Structure	0.211	1.782	0.076	Not accepted	0.379	0.043	0.000	(0.039)	0.432	
H7	Org_Culture -> Org_Structure	0.460	4.322	0.000	Accepted	0.379	0.207	0.062	0.238	0.655	