The Antecedents of Successful and Impactful innovation: The Case of the Qatar Foundation

by

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Abstract

Innovation is considered an essential element that supports achieving a competitive advantage in a complex business environment. It has been studied extensively in the conventional, for-profit context, where literature has described the need for innovation in various aspects of an organisation to increase the likelihood of business success. However, the study of innovation in a social context with large Non-Profit Organisations (NPOs) has been limited, with literature only describing the need for innovation for NPOs to guarantee survival without identifying the actual antecedents and processes that lead to better performance of social innovation. This study positions itself to fill this knowledge gap by identifying the key antecedents of innovation for NPOs and their influence on innovation performance. Using the Resource-Base View (RBV) and the Dynamic Capabilities Theory (DCT), this research will answer the research question: What are the key internal antecedents of innovation within NPOs? How do they influence innovation processes and performance?

This study answers the research question using cases of multiple types of innovation, product, management and process innovation, with an exploratory research design. It adopts a comparative case-study and uses a cross-case analysis approach by analysing six innovation projects managed by the Qatar Foundation (QF). The study uses in-depth interviews of 22 participants who are directly involved with innovation projects within the organisation to investigate the influence of the antecedents of innovation on processes and performance.

The findings reveal that the antecedents of innovation which exist within a non-profit organisation such as the Qatar Foundation have a significant impact on the processes

followed in managing innovation projects and on innovation performance. Having a clear vison and strategy, adequate resources, a structure and a culture that boosts innovation with motivating and collaborative individuals and a level of flexibility in the policies and procedures can ensure better innovation performance. The findings complement earlier studies and provide a comprehensive understanding of the antecedents influencing innovation processes and performance for NPOs. These findings contribute to theory by showing the applicability of the RBV and DCT in a social context and have practical implications to management and strategists in NPOs by showing how to increase the prevalence of innovation to best execute the projects. These contributions are captured with a framework that is developed using the existing literature in the field and the findings of the study. Future work should include validating and evaluating the effectiveness of the framework across other QF projects and other NPOs.

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Abbreviations	What it stands for
QF	Qatar Foundation
QF R&D	Qatar Foundation Research & Development Division
QSTP	Qatar Science and Technology Park
QCRI	Qatar Computer Research Institute
PPE	Policy, Planning and Evaluation Department
FM	Facilities Management
AIDR	Artificial Intelligence for Disaster Response
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
PMS	Performance Management System
NIS	National Information System
CAFM	Computerised Aided Facilities Management
VTS	Vehicle Tracking System
SAP	Systems Applications and Products
QCA	Qualitative Comparison Analysis
KPIs	Key Performance Indicators
OECD	Organisation for Economic Co-operation and Development
RBV	Resource Based View
DCT	Dynamic Capabilities Theory
IVC	Innovation Value Chain

Chapter 1: Introduction

1.1. Introduction and background

In today's complex business environment, the ability of organisations to innovate is considered a critical requirement for achieving and sustaining competitive advantage and becoming more responsive to the rapidly changing business environment (Novelli, et al., 2006; Yusof and Shafiei, 2011; Mohammad et al., 2015). Souto (2015, p. 152) states that "*innovation is more than technological and scientific progress, it is new ideas related to a firm's business, rethinking a firm's business, and finding new unexplored ways of how to run that business*." In that regard, although innovation is inherently associated with uncertainty (Christiansen and Varnes, 2009), complexity (Lu and Chen, 2010), cost (Dereli et al., 2011), and risk (Totterdell et al., 2002), numerous organisations consider it a pathway to operational, process and product improvement, all of which are critical to their success (Hauser et al., 2006; Kester. et al., 2011; de Oliveira et al., 2015).

Innovation within organisations has been widely studied in the extant literature. Numerous scholars in the field of innovation (Rothwell, 2007; Gilbert and Cordey-Hayes, 1996; Walker et al., 2007; Cotterman et al., 2009) have examined firms that succeeded in developing technologies and new products or introducing services to identify the antecedents and critical success factors of organisational innovation and discover the efficient methods for innovation management. In doing this, the scholars developed varying methodologies and frameworks which they used to study successful innovations and provide insights to key questions such as (i) particular organisational structures for successful innovations; and (ii) integrated development processes and market research methodologies that lead to

successful innovation (Cotterman et al., 2009). However, the findings of these studies have been inconclusive and/or inconsistent with regard to some key aspects of innovation such as factors impacting innovation success or to what extend a project is considered "*innovative*" or "*technologically advanced*" (Panne et al., 2003).

In addition to the aforementioned inconsistencies, there are also different definitions and perspectives with regards to the significance of antecedents behind successful and unsuccessful innovations. Whilst certain scholars propose a particular cluster of antecedents to be vital, other scholars may disregard those antecedents and propose different antecedents. Scholars in the innovation field have investigated this concept in product/project level (Tiwana, 2008; Cassiman et al., 2009) and firm level (Gianiodis et al., 2014; Kraiczy et al., 2015) using different key factors such as innovation management practices (Keupp et al., 2012; Tidd and Thuriaux-Aleman, 2016); network (Rese and Baier, 2011; Gnyawali and Srivastava, 2013); human resource (Antonioli et al., 2011; Wallace et al., 2013); innovation strategy (Peeters and Potterie, 2006; Jayaram et al., 2014); organisational innovation system (Koberg et al., 2003; Lancker et al., 2016); innovation process (Brophey et al., 2013; Nicoletti, 2015); and performance (Hsu et al., 2015; Wang and Li, 2017).

The more-recent literature on innovation is now attentive on establishing how organisations can implement successful and impactful innovations with integrating their intra-organisational operations and innovation activities with strategic partners, suppliers and customers (De Marchi, 2012; Mueller et al., 2013). Also, to understand how the organisational strategies and practices should be aligned with the organisation's innovation system in order to increase the odd of innovation success (Ramirez et al., 2011; Saemundsson and Candi, 2014). All these observations and developments have led to a

fragmentation of the literature on innovation so that its present state is characterised by many inconsistencies, diverse conceptualisations of the determinants of innovation, theoretical frameworks competing, and knowledge gaps (Fagerberg and Verspargen, 2009; Keupp et al., 2012). Yet, to date, while research offers a wide range of practices and strategies to implement successful and impactful innovations within organisations, the antecedents of successful innovation still remain unclear (Jansen et al., 2006; Donate and Guadamillas, 2011).

1.2. Research context

1.2.1. Non-Profit Organisations (NPOs)

Non-profit organisations (NPOs) are also known as non-business entities, not-for-profit organisations or non-profit institutions. In contrast to conventional business entities, NPOs are set up with the goal of furthering a social cause or pressing forward for a shared point of view. They are set up to benefit the public in general instead of generating profits for the owners and investors (Hwang and Powell, 2009). Examples of social causes that are typically undertaken by NPOs for the benefit of the public include healthcare, education, shelter, employment, research and food. NPOs can take various sizes ranging from city-level organisations to organisations whose influence spans across the globe. NPOs can also be differentiated by the social causes that they focus on, as some operate on a small subset of social causes while others simultaneously operate on a wide range of social causes, typically by forming independent departments that focus on a small group of social causes. NPOs can be privately owned, semi-privately owned with some ownership by the state or wholly state owned. Although a lot of their projects generate an operating revenue, NPOs typically require the financial backing of private donors from people who believe in the social

causes pursued by the NPO or state grants to take on new projects or to make up for any budget deficits (Hwang and Powell, 2009).

Despite the numerous differences in NPOs across the world outlined earlier, one thing is for certain: NPOs play a critical role in providing social services that would otherwise be very difficult to achieve using conventional profit-driven organisations as their primary objectives are mis-aligned. In order to survive an ever-changing business environment, NPOs need to innovate to adapt, become responsive and improve their survival chances (Hwang and Powell, 2009). This is necessary to ensure that the external funding given to NPOs is used in a more efficient manner, thereby reducing the reliance of external funding – which can prove to be unpredictable – in the future. Innovation is also necessary to increase the effectiveness of the projects carried out by the NPOs and ultimately improve the execution of the social causes in a dynamic environment.

In the context of NPOs centred around social causes, innovation is usually coined 'social innovation'. There are varying definitions of social innovation vary, but all centre on the creation and diffusion of a product, process, or idea. Similar to conventional technical innovation, social innovation involves developing novel products and solutions to address societal issues. In that regard, Mulgan et al., (2007, p. 9) define social innovation as "*the development and implementation of new ideas (products, services and models) to meet social needs*," and Mumford et al., (2015, p. 253) posits that social innovation "*refers to the generation and implementation of new ideas about how people should organize interpersonal activities, or social interactions, to meet one or more common goals*."

In the not-for-profit sector, innovation is considered paramount to operational successes (Cohen et al., 2013; Damanpour, 1996). Innovation is valued important for non-profit

organisations and equally is regarded as crucial for for-profit organisations. Similar to general organisations, the need to implement innovation is quintessential for the sustainability of non-profit organisations. However, adaptation is required for these organisations in order to develop new methods to enable innovation. By doing so it will enable them to overcome challenges which surround their business environment (Cohen et al., 2013; Damanpour, 1996). It is imperative to study the antecedents of innovation for NPOs – particularly the large, multi-sectoral ones – as they play a pivotal role in fulfilling the social causes in a particular country that would otherwise be very difficult to achieve using conventional organisations alone. Moreover, the larger NPOs typically require a high financial outlay to execute the projects that they embark on, with a potential stagnation in innovation leading to an inefficient utility of the constrained financial resources that they possess. When applied to the array of projects carried out by NPOs, innovation helps guide the focus of the organisation towards projects that have maximal utility, thereby increasing the efficiency of execution of the social cause in general and providing the greatest benefit to the country in which they operate in. Therefore, studying the antecedents of innovation is crucial for NPOs to help increase the likelihood of successful execution of various social causes and use their available resources in the best possible manner.

The growth of the non-profit sector has led to major managerial changes, such as the professionalisation of organisations (Hwang and Powell, 2009). Non-profit organisations have addressed the necessity to raise their effectiveness and efficiency by adopting better managerial practices (Anheier, 2014; Hwang and Powell, 2009). Indeed, the production processes in NPOs are strongly based on human inputs and intangible factors (Akingbola, 2013), similar to the process of management innovation (Volberda et al., 2014). Thus, NPOs provide a relatively unexploited and specific field of research on social innovation. However,

despite the acknowledgment of the importance of innovation to non-profit organisations, there is a significant gap in knowledge about the subject (Schin and McClomb, 1998). While it was suggested that social workers turn to other fields to get a better understanding of innovation and factors affecting it, the innovation models currently available offer little direction to those who want to influence organisational innovation (Wolfe, 1994).

1.2.2. The State of Qatar

The State of Qatar is an independent and sovereign peninsular Arab country located in the Middle East that is attached with Saudi Arabia and the Arabian Gulf (World Bank, 2020). Since its independence from Britain in 1971, Qatar has been recognised as one of the world's most important producers of oil and gas (Ministry of Foreign Affairs, 2020). One of the main resources is the Liquefied natural gas (LNG), accounting for more than 60% of the country's exports in 2019 (Planning and Statistics Authority, 2020), placing Qatar among the largest gas and liquefied natural gas producers and exporters. To become less dependent on oil and gas, the State of Qatar follows Qatar National Vision 2030 (Elgendy, 2011), the development plan with an aim to transform Qatar into an advanced society capable of achieving sustainable development. The development plan focuses on four different pillars, economic, human, social and environmental development. Economic development strategy which focuses on avoiding over reliance on natural resources and becoming one country that will have a major role in the knowledge-based economy (Elgendy, 2011). Moreover, QNV 2030 economic policies provide the infrastructure policies for small and medium-sized enterprises (SME) intending to diversify economy (Knight, 2014). The human development pillar aims to improve education, healthcare services, employment opportunities and raise cultural awareness (Elgendy, 2011). The country accommodates seven National universities

and nine international university campuses and some top science and research funding bodies such as Qatar National Research Fund (QNRF) (Hukoomi, 2020).

1.2.3. The Qatar Foundation

The Qatar Foundation (QF) is a non-profit organisation that has more than 50 entities under its umbrella working in education, research, and community development. It was founded in 1995 by His Highness Sheikh Hamad Bin Khalifa Al Thani, the Father Amir, and Her Highness Sheikha Moza bint Nasser (Qatar Foundation, 2020). QF is financially supported by a sizable endowment established by the Amir of the State of Qatar. This allows QF to be less restricted from financial difficulties that are common due to changes in the governmental budget allocations and fluctuations in the oil prices (Knight, 2014). QF staffs between 4000 and 5000 employees depending on the active projects (Qatar Foundation, 2020).

The aim of the organisation is to support the strategic priorities outlined in the Qatar National Vision 2030, which are aimed at the creation of national economic sustainability through innovation in education and research. By taking the initiative of leading the social, economic and human development the body also intends to become a role model for the world (Qatar Foundation, 2020). QF is determined to support innovations that contribute towards the development of the knowledge-based economy which can create various opportunities from education, career opportunities and work experience to enabling people of all ages to contribute to the country's prosperity (Hukoomi, 2020).

The Qatar Foundation in its commitment to develop innovation across its scope of mission has initiated as a strategic move to partner with key stakeholders towards realising its mission. QF is the major vehicle that the Qatar government has used to drive to exploit its R&D potential and develop into a knowledge-based economy driven by technological

advancement. Qatar has invested a vast number of resources to establish a well-equipped and structured environment with outstanding infrastructure to support its aims.

The main pillars of QF are science and research, community development and education; the detailed organisation structure can be found in Appendix A. The science and research pillar aims to create a research culture and human capacity in the country to support the knowledge-based economy. QF creates a thriving research culture through innovations in multiple fields (Qatar Foundation, 2020). QF has collaborations with foreign institutions to make sure that the knowledge is exchanged with the rest of the world.

QF is truly a unique organisation that operates in many fields within its different pillars. In the succeeding sections the department/institutes of Qatar Computing Research Institute (QCRI), Policy Planning and Evaluation (PPE), and Facilities Management will be elaborated on the basis of case selection.

Qatar Computing Research Institute (QCRI)

The Qatar Computing Research Institute (QCRI) is a national research institute established by QF, it operates under the Hamad bin Khalifa University that is part of the Education pillar of QF (Anon, 2020). This institute aims to enhance the technology and innovation for the sustainable development. Its main research streams are social computing, data analytics, cybersecurity and Arabic language technologies. The institutes collaboratively work with QSTP to introduce commercial applications for the research purpose. QCRI, with all other departments supports the strategic priorities outlined in Qatar National Vision 2030 (Anon, 2020).

Policy Planning and Evaluation (PPE)

A Policy Planning and Evaluation (PPE) department is under the Science and Research pillar of QF. This department is responsible for facilitating research and development of policy, portfolio analysis, coordination, evaluation and strategic planning divisions. It works in line with several bodies such as QNRF, Qatar Science and Technology Park (QSTP) and The Office of Intellectual Property and Technology Transfer (Bizri, 2017). Moreover, the department maintains the balance of fund allocation between R&D projects and other national priorities as well as the international markets. It drives IP creation, tech-based development and technology commercialisation (Bizri, 2017).

Facility Management

Facility management is a centralised directorate that is located under the QF Headquarter Directorates. It provides services to all headquarter Directorates, Centres, Universities and Joint Venture organisations. The directorate is responsible for achieving maximum customer satisfaction while maintaining low cost of assets. The department strives to provide a high level of service which is better than external bodies. It consists of four departments: “planning and development, business support, operations and maintenance and the department of general services” (Qatar Foundation, 2020).

1.2.4. Types of Innovation Considered

There are many different types of innovation under the umbrella term, ‘innovation.’ This research focuses on three major innovation types: *product innovation* (commercialising a significantly improved or completely new product or service), *process innovation* (presenting newly or significantly improved methods in organisation operations) and *management innovation* (newly introduced or improved management process and system or organisational methodology or operational practice). These categories were chosen due to

(i) the availability of information and the relevance of these types of innovation with the Qatar Foundation projects, (ii) the fact that the Qatar Foundation operates in a developing country with limited potential of introducing radical technology, and (iii) their applicability to a wide range of NPOs as they are amongst the most common types of innovation pursued. These types of innovation possess different characteristics and have characteristic patterns of diffusion (Edquist et al., 2001; Totterdell et al., 2002; Camison and Puig-Denia, 2016) and can be impacted in numerous ways by both organisational and environmental factors (Walker, 2007; Murat Ar and Baki, 2011; Prajogo and McDermott, 2011).

1.2.5. The Nature of the Case Studies

The study investigates 6 case studies (2 for each type of innovation considered) as it enables a meaningful cross-case analysis. The *product innovation* cases investigated are in the field of computing science (the AIDR and Jalees cases), the *process innovation* projects are from the operations and transportation departments (the CAFM and VTS cases) and the *management innovation* cases are selected from the R&D division of the policy, planning and evaluation department (the PMS and NIS cases). The AIDR (Artificial Intelligence for Disaster Response) case study involves a project in the company that uses Artificial Intelligence in a novel way: to provide instant access to the most relevant data in times of emergency or disaster. The Jalees case study looks at a PDF and electronic book reader developed by the QF designed to solve the need for Arabic support in electronic document readers. The CAFM (Computerised Aided Facilities Management) is a project developed by QF to automate the workflow process and generate reports automatically in contrast to manual execution, thereby allowing for more efficient completion with less room for error. Similarly, the VTS (Vehicle Tracking System) was developed to track the locations of buses on an academic campus to reduce the likelihood of delays and allow for more productive

movement across the campus. The PMS (Performance Management System) was created to monitor and manage the various projects executed and worked on by the QF, something especially relevant in a highly diverse NPO like the QF. The NIS (National Information System) was developed to act as a suppository of national information that can be quickly accessed in a convenient manner, thereby improving security and accountability in the NPO.

1.3. Research rationale

Successful and impactful innovations depend on the organisation combining a range of resources and capabilities, including the capacity to access finance, recruiting high-skilled staff, understanding market needs, and establishing effective interactions with other key actors (D'Este et al., 2012). Innovating organisations in our modern business environment necessarily are forced to cope with most of these challenges, if not all of them. These difficulties and challenges have led some organisations to deter from engagement in innovation activities and remain locked into established routines. Some organisations, however, do try to be more involved in innovation activities and invest in informal or formal R & D but may be unsuccessful to achieve desirable innovation outcomes and bring new processes or products to market because they are not capable of overcoming these challenges. Therefore, it is important to know about the antecedents of successful and impactful innovation and see innovation as a dynamic process, a chain of stages, that needs some prerequisites as well as an effective innovation management to improve innovation outcomes significantly.

The extant literature on the antecedents of innovation and management of innovation has focused primarily on firms or on public organisations (Damanpour and Evan, 1984; Damanpour and Schneider, 2009). Although these studies have mainly been performed in

the for-profit sector, both academics and non-profit professionals have agreed on the necessity of innovation in non-profits, given the environmental changes in this sector (Choi, 2012; Gummer, 2001; Jaskyte and Dressler, 2005; McDonald, 2007; Perri, 1993). Innovation studies in the non-profit service sector are still rare and based on a narrow conceptualisation of innovation, focusing only on the output of innovation. Probably the first innovation study in non-profit human services, conducted by Perri (1993), suggests innovation is composed of product innovation, process innovation, and administrative innovation. Basing their definition on Damanpour's (1996) and Perri's (1993) typologies of innovation, Jaskyte et al., (2005, 2006) define innovation as "the number of innovations in the last two years" in three types of innovation: administrative, product, and process. These studies attempted to categorise innovation activities in non-profit organisations, but none of them investigated the inter-relationships among them. Hence, it can be stated that, with relation to innovation in non-profit organisations, it can be stated that research has remained ambiguous.

1.4. Research gap

Through the literature, it can be stated that Enterprises in a cycle of innovation activities, from idea generation and pre-innovation planning to development and market introduction are involved in a wide range of uncertainties and challenges (Buschgens et al., 2013; Wang and Rafiq, 2014) that need to be considered for successfully achieving the innovation outcomes. This study aims to provide a substantially richer understanding of the internal antecedents of successful innovations within non-profit organisations. This is particularly pertinent because NPOs pursue missions to serve needs that the business sector does not serve (Hansmann, 1980; Pestoff, 1992; McDonald, 2007). This means NPOs cannot rely on profit and lack the taxing authority of the government sector (Hansmann, 1980). Therefore,

NPOs employ a unique operational model and depend on multiple stakeholders for the resources needed to deliver services to their constituents. Therefore, identifying and understanding the antecedents and innovation processes in NPOs will provide insights into the dynamism and responsiveness of their operational models.

The increase in external environmental challenges faced by NPOs has attracted the attention of researchers. These researchers have argued that NPOs must adopt entrepreneurial postures in their operations (Sharir and Lerner, 2006; Weerawardena and Sullivan Mort, 2001); adopt innovative practices (Jaskyte, 2004; McDonald, 2007; Weerawardena and Sullivan Mort, 2006) focus on outcomes targeted by government policy and pursue innovative ways of delivering superior value to the target market in order to capture competitive advantage (Weerawardena and Sullivan Mort, 2001). Some researchers suggest the need for market orientation (Nicholls and Cho, 2006) to meet the increased competition. Others suggest 'market-isation' or the adoption of business models, which may conflict with the core ideals of NPOs, in particular their social mission (Eikenberry and Kluver, 2004). This study seeks to examine the dynamics of innovation in NPOs by investigating the pathways to successful innovation outcomes through innovation input, process, and output. This includes exploring the impact of antecedent factors of innovation on performance.

The review of the innovation literature indicates that a large body of theoretical and empirical studies have been conducted to evaluate factors contributing to success or failure of innovation within organisations (Balachandra and Friar, 1997; Astebro, 2004; Cheng et al., 2013; Bouncken and Fredrich, 2016). However, there is still a high rate of failure in operating innovation projects (Cooper, 2011). The majority of studies focus on innovation processes

(Brophey et al., 2013; Salerno et. al., 2015) or innovation outcomes (Awate, et al.,, 2012; Nieves, 2016) in public or for-profit organisations. Just like in conventional organisations, different factors can positively or negatively affect the innovation process and outcome in NPOs. Thus, understanding the whole innovation process from idea generation to market introduction is an area of critical importance in decision-making and managing of innovation in NPOs. This brings into consideration the requirement of understanding innovation from different perspectives.

1.5. Research aims and objectives

This research aims to explore the antecedents of innovation and their influence on innovation process and outcomes within non-profit organisations. In order to achieve this aim, the following objectives are proposed:

- To review existing definitions, concepts, types and successes of innovation within organisations.
- To identify key antecedents of innovation within organisations that manage innovation projects.
- To investigate the impact of the identified key antecedents of innovation on projects within non-profit organisations.
- To develop a framework that recognises the impact of key antecedents of innovation on processes and innovation performance within non-profit organisations.

These aims and objectives are formed to fulfil the intended contributions of the study, which include identifying the key antecedents of innovation and their influence on innovation process and outcomes within non-profit organisations.

1.6. Chapter Summary

Chapter 1 (Introduction): This chapter provides a contextual background to the research within this thesis. It provides a research context that reviews existing studies with relation to innovation concepts, antecedents of innovation and where research lacks with relation to non-profit organisations. It concludes with identifying the research gap, stating aim and objectives.

Chapter 2 (Literature Review): This chapter commences with reviewing the existing definitions, concepts, types and successes of innovation from previous studies. It extensively provides a review of the impact of antecedents of innovation at firm and project levels on innovation. The chapter also reviews stages of innovation, and innovation outputs with highlighting the lack of focus on non-profit organisations. Through the chapter, the researcher identifies a number of theories that can support the investigated phenomenon, but more importantly supports deriving a conceptual framework that is used to formulate the basis of primary data collection.

Chapter 3 (Methodology): This chapter documents the methodological justification for this research. The research adopts an interpretivist research paradigm following inductive inquiry that uses qualitative data to derive the evidence. The research uses case study, as it provides rich strategy when investigating complex phenomenon where the case study is the Qatar Foundation. Six innovation projects are chosen based on criteria (explained in the chapter) where interviews are used to collect the data.

Chapter 4 (Case Analysis): This chapter outlines the results and analysis based on the responses gathered using interviews. It is structured based on the department where a project belongs to (e.g. AIDR and Jalees), which means every two projects are analysed

together. Thematic analysis with the use of themes highlighted in the conceptual framework produced in Chapter 2. A number of sub-themes have emerged, which were used as the basis to form cross-case analysis.

Chapter 5 (Cross-case Analysis): This chapter compares the analysis derived from the six projects where the comparison was done at an organisational, departmental and project levels. The analysis showed that depending on nature of the department and the project, the impact of antecedents and stages of innovation have differed. More importantly, the chapter concluded with a diagram that represents an abstraction of the process that an innovation project goes through within the context of the Qatar Foundation.

Chapter 6 (Discussion and Practical Implications): This chapter discussed the main outcomes from the cross-case analysis with the literature to inform the framework developed in Chapter 2. Based on the discussion, it is shown that innovation within non-profit organisations requires holistic thinking that should start with innovation value and impact in order to gain richer understanding of the impact of antecedents of innovation and stages of innovation.

Chapter 2: Literature Review

2.1. Introduction

Given the importance of innovation on the performance and overall health of firms in today's competitive and dynamic business environment (Li et al., 2012; Husain et al., 2016), innovation has been widely studied in the management field (Leal-Rodriguez et al., 2014; Bennett and Parks, 2015; Nieves, 2016). Organisations face the challenging task of deploying successful innovation projects to enhance organisational performance and sustainability (Leiblein and Madsen, 2009; Wang and Rafiq, 2014). However, making a success of innovation projects is a complex task. Extant literature shows that there is a particularly high failure rate in innovation projects due to various challenges in development and commercialisation of projects (Cozijnsen et al., 2000; Chiesa and Frattini, 2011; Cooper, 2011; Story et al., 2014; Jones et al., 2016). In light of this development, there is an obvious need to systematically evaluate the causes or variables that lead to successful and unsuccessful innovation projects.

In this chapter, a review of extant literature on innovation management is conducted so as to better develop understanding of key antecedents of innovation management and how innovation projects should be managed to improve the odds of innovation success. In addition, this chapter explores the extant literature with the aim of analysing the critical factors for innovation success within organisations. The chapter also proposes a research framework which has been developed by the researcher to empirically investigate the research question identified in Chapter 1 of this thesis.

2.2. Innovation: An Overview

Innovation is considered a multidimensional and multifaceted phenomenon (Rosenbusch et al., 2011). It has many aspects that spread across various research areas (Baregheh et al., 2009; Tidd, 2001). Innovation is widely considered to lead to competitive advantage, which leads to improved business performance (Mone et al., 1998). The significance of innovation is not only restricted to business organisations but is also a determinant of policy and strategic issues for economies (Baregheh et al., 2009). However, there are numerous differing definitions of innovation proposed by scholars. Generally, innovation is associated with something new or different. An action is considered innovative when it changes current routine actions using new solutions and novelty. Originally, the word innovation "comes from the Latin (in) and (novare) to change or to make something new" (Bessant and Tidd, 2007, p. 12). The Oxford and Cambridge English Dictionaries define innovation as "*a new method, idea, product, etc*." and "*the use of a new idea or method*", respectively.

2.2.1. Innovation Definitions

Schumpeter first defined innovation in the early 20th century (Hansen and Wakonen, 1997). For the first time, he defends the role of innovation as an engine of economic growth and organisation prosperity (De Medeiros et al., 2014; Walker et al., 2015). According to Schumpeter, innovation is "*a new product or to a new quality of product, a new method of production, a new market, a new source of supply of raw materials or half manufactured goods and finally implementing the new organisation of any industry*" (Schumpeter, 1942, pp. 84-85). In other words, "being different in doing things". However, Schumpeter's innovation definitions as argued by Hagedoorn (1996, p. 886) are "broad and vague". According to OECD (2005) innovation is "*the implementation of a new or significantly*

improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations". There are many other definitions of innovation brought forward by numerous scholars in the field as summarised in Table 1.

Table 1: Innovation definitions

Author	Definition
Joseph Schumpeter (1934, p.66)	"a new product or to a new quality of product, a new method of production, a new market, a new source of supply of raw materials or half manufactured goods and finally implementing the new organisation of any industry"
Thompson (1965, p.2)	"Innovation is the generation, acceptance and implementation of new ideas, processes products or services".
Becker and Whisler (1967, p.463)	"Innovation is a process that follows invention, being separated from invention in time. Invention is the creative act, while innovation is the first or early employment of an idea by one organisation or a set of organisations with similar goals".
Zaltman et al. (1973, p.5)	"any idea, practice, or material behaviour perceived to be new by the relevant unit of adoption"
Drucker (1985, p.11)	"Innovation is the specific tool of entrepreneurs, the means by which they exploit changes as an opportunity".
West & Farr (1990, p.18)	"the intentional introduction and application within an organisation of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the organisation or wider society".
Damanpour (1992, p.378)	"Innovation is the adoption of an idea or behaviour, whether a system, policy, program, device, process, product or service, that is new to the adopting organisation".
Business Council Australia (1993, p.8)	"Adoption of new or significantly improved elements to create added value to the organisation directly or indirectly for its customers."
Nohria and Gulati (1996, p.1251)	"Any policy, structure, method, process, product or market opportunity that the manager of a working business unit should perceive as new. "
Rogers (1998, p.7)	"Involves the creation of knowledge and diffusion of existing knowledge."
Boer and During (2001, p.84)	"Creating a new association (combination) product- market-technology-organisation."

Rogers (2003, p.11)	“any idea, practice, or object perceived as new by an individual or other unit of adoption”.
OECD (2005, p.9)	“The implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations”.
Du Plessis (2007, p.21)	“Innovation as the creation of new knowledge and ideas to facilitate new business outcomes, aimed at improving internal business processes and structures and to create market driven products and services”.
Baregheh et al., (2009, p.1641)	“Innovation is the multi-stage process whereby organisations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace”.
Crossan and Apaydin (2010, p.1156)	“Production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres; renewal and enlargement of products, services, and markets; development of new methods of production; and establishment of new management systems.”
Battisti and Stoneman (2010, p.191)	“An innovation is the introduction of a new or significantly improved product, process, organisational method, or marketing method by your enterprise. The innovation must be new to your enterprise, although it could have been originally developed by other enterprises”.
Mention (2011, p.44)	Innovation is an interactive process between the firm and its environment, as the result of the collaboration between a wide variety of actors, located both inside and outside the firm.
Trott (2012, p.16)	Innovation is a management process that is heavily influenced by the organisational context and the wider macro system in which the organisation exists.
Gault (2013, p.12)	Gault (2013) adopts the OECD definition of innovation, adding that innovation is a broad concept, and the implementation of an innovation policy is not straightforward.
Souto (2015, p.144)	Innovation is the commercialization of an invention, but it can be also described as bright new ideas that are brought to the market by implementing these bright new ideas into firms’ products, processes, or organisational methods.

(Source: summarised by researcher based on references in the table)

In addition to the absence of commonality between scholars about the definition of innovation, there is also debate between scholars about the difference between innovation

and invention. Usually, innovation is associated with ideas, knowledge creation and learning. However, invention according to Becker and Whisler (1967) is a “creative act”. In other words, invention is the creation of something brand new which has never been created before. Whereas innovation is considered the effective utilisation and deployment of ideas to reach its commercial ends (Schumpeter, 1942). Drawing upon Kumar and Phrommathed (2005, p.7), innovation is more than invention as it goes beyond “*basic and applied research*” to developing and upgrading products, marketing, manufacturing and so on. Therefore, it can be said that innovation implements ideas in a practical way and enables it to reach the market, which ultimately influences the economy.

It can be argued that it is impractical to consider any new thing or any change as an innovation. Crossan and Apaydin (2010) go a step further by considering innovation as beyond “doing something new” as it is the result of implementing new ideas successfully. They broadly define innovation as “*production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres; renewal and enlargement of products, services, and markets; development of new methods of production; and establishment of new management systems*” (p. 1155). As this study focuses on innovation within business organisations and environments, this definition of innovation has been adopted for this study. It is a comprehensive definition, and it will correspond to this study’s broad scope objectives. In other words, this definition is broad and thus enables our review to include different aspects of innovation thereby countering the potential of selection biases that can often arise due to discrepancies or differences in definition. The definition also guides our review in accommodating the range of innovation types (product/service, process, management, technological, etc.) that typically constitute firm innovation. This holistic approach is paramount in ensuring the practical applicability of the findings of this

study and also removes the need to gather data on a fragmentary basis from the diverse literature.

2.2.2. Schumpeterian and Kirznerian Perspectives of Innovation

Innovation can also be viewed through the lens of the Schumpeterian and Kirznerian perspectives, which both deal with innovation from the point of view of entrepreneurship to explain how opportunities in the market are identified and exploited. These perspectives are usually viewed from the point of view of a profit-maximising entrepreneur, in which the entrepreneur creates a framework of opportunity with which resources can be recombined for a novel execution of their ultimate motive, which is usually a profit (Shane, 2003). The ultimate motive of NPOs differs from that of an entrepreneur as they do not aim to make economic profits, which suggests that the Schumpeterian and Kirznerian perspectives of innovation can be thought of as a way to explain the manner with which NPOs best identify and exploit opportunities related to their social causes.

The Schumpeter (1934) point of view presents entrepreneurs as people who actively use innovation to pursue change and search for ‘new combinations’ in the market to help them fulfil their primary goal. According to Schumpeter (1934), new information in the market is created by changes in factors such as technology, politics, rules, regulation and other socio-economic factors. This new information can be used by an entrepreneur to form new combinations of products and services. Thus, the Schumpeter point of view presents entrepreneurs as market participants that search for and make use of opportunities through innovation (de Jong and Marsili, 2014). In contrast, Kirzner (1973) views entrepreneurs from a more passive point of view. In this view, opportunities in the market are not necessitated by innovation or other socio-economic changes in the market conditions mentioned earlier. Instead, new opportunities are identified and exploited by information asymmetries in the

market, whereby market participants make entrepreneurial profit by ‘sensing’ new opportunities as a result of an imperfect distribution of knowledge in the market. They are then able to act on this information before others and ultimately gain a profit. In other words, they sense and exploit market opportunities through ‘alertness’ rather than ‘innovation’ (de Jong and Marsili, 2014).

There is no single correct way to view innovation and it is rare to see companies with purely Schumpeterian or Kirznerian perspectives (de Jong and Marsili, 2014). Instead, opportunities in the market exhibit differing extents of membership towards one of the perspectives, with the Schumpeterian commonly seen in large organisations operating in growing markets who have a focus on future needs and the Kirznerian seen in much smaller organisations in which entrepreneurs are more focused on present needs (de Jong and Marsili, 2014). For this project it is assumed that NPOs such as the Qatar Foundation are driven by innovation to identify and act on opportunities in the market. Such entities operate in growing markets and have a strategic focus on future needs, thereby suggesting that the Schumpeterian point of view is suitable.

2.2.3. Importance of Innovation to Organisations

In current business settings, innovation is considered vital to the survival and competitiveness of organisations. As stated by Ebadi and Utterback (1984), the primary purpose that leads organisations of large sizes to invest in innovation is to reduce the overall unit costs mainly through an improvement of the capacity of production due to their existing economies of scale. Lee et al. (2010) find that extant literature on organisational innovation mostly relates to studies on competitive advantages generated through innovation in large multinational organisations, rather than small to medium enterprises. The main reasons are because large organisations can achieve specific benefits based on economies of scales

and increase of market share through the use of innovative processes (Sharif, 2006). Also, while a small and medium organisation usually operates within a limited market and with the manufacturing and sale of a single product, multinational organisations need to compete in larger markets with different products and with a higher level of technology (Sahal, 1981). Large organisations can benefit from the introduction or increase of innovation, from more effective productivity and considerable reduction of its production costs (De Castro et al., 2010).

According to Souder and Moenaert (1992), unlike small organisations that base their main activities on a single product in a limited market, large organisations can benefit from innovation due to a broader range of products due to a more significant number of opportunities for making sales and profits that make them more attractive to potential investors generating a higher liquidity. Also, Valencia et al. (2010), stated that innovative processes enhance the opportunity for multinational organisations to face fewer issues related to environmental pollution and avoid finance charges and fees from the governments of the countries where they operate. Innovation is also intended to develop a process that reduces the emissions of carbon and production of wastage to comply with the legal changes across the world (Valencia et al., 2010,). According to Trott (2005), innovation generates not only more modern and efficient production processes, but also potential Unique Selling Points (USPs) that are considerably different from existing products in the market and that can attract more customers willing to pay an additional cost to benefit from them. This innovative aspect generates a higher level of loyalty and ensures to large organisations a considerable market share.

In addition to focusing on innovation from the operational perspectives shown earlier (using innovation to enhance a product offering), it is important to look at innovation from a process

point of view, whereby innovation is applied to refine the techniques used to develop the products and services. As shown by Ettlie and Reza (1992), a focus placed on the actual processes and methods used to produce the final product or service can lead to substantial improvements in overall productivity. This claim is substantiated with the example of a fluid catalytic cracking process introduced in the 1940s to give a 98% saving in labour costs, 80% savings in capital costs and a 50% saving in material costs per unit of output (Ettlie and Reza, 1992). It is thus imperative to not only focus on the operational aspects of innovation but also on how innovation can be applied to refine the internal processes used by the organisation. Overvest and Veldman (2008) investigate the incentives for project leaders to adopt process innovation. Their study finds that manager-led firms (typically tackling a wide range of projects at the same time) are more likely to innovate the processes used to develop their products and services as it leads to a direct cost savings when compared to owner-led firms. These findings can be extended to large, manager led NPOs like the Qatar Foundation, to predict that they will have a strong tendency to innovate in their processes rather than simply focus on operational aspects.

Fritsch and Meschede (2001) investigate the relationship between the firm size and proportion of Research and Development (R & D) resources devoted to process innovation. They found that firms tend to spend more on innovation as they increase in size to maintain a competitive edge. More importantly, their results show that firms tend to spend more on process innovation as compared to product innovation. This suggests that process innovation is very crucial for large NPOs like the Qatar Foundation, where it could prove to be more pronounced that product innovation. Cucculelli and Peruzzi (2020) investigate the impact of the life cycle and firm size on the nature and extent of innovation. A systematic analysis of 9602 European firms shows that firms in the growth stage tend to focus on

product innovation which tends to evolve to process-oriented innovation as the firms moves towards maturity. This trend is apparent as companies are less prone to introduce ‘risky’ products during the mature stage. Large NPOs like the Qatar Foundation are moving towards maturity, thereby showing the need to consider process-level innovation as well. Hullova et al. (2016) demonstrate the complementarity between process and product innovation, with a tendency of the type of innovation pursued dependent on the aims of the project, the conditions and context that the company operates in and the resources and capabilities available to the company. This shows that there is no unique perspective of innovation that ensures success, but rather multiple operational and process-driven aspects must rather be considered in tandem.

An additional perspective of innovation discussed in literature is innovation the point of view of the management within the company. Yang et al. (2020) describe management innovation as being ambiguous and hard to replicate, although attainable by changing the operational structures (for instance from hierarchal to horizontal), management processes and applications of information technology. After describing the importance of management innovation, Yang et al. (2020) propose a framework to explain the adoption of management innovation in a case of explorative and exploitative market learning conditions. An interesting example of how management innovation can be best used to facilitate innovation in the final product and service is the case of Apple electronics as described by Podolny and Hansen (2020). The fate of the company was radically transformed through a change in management structure whereby a hierarchal to horizontal move was made and distinct functional departments were formed and were ran with independent managers (Podolny and Hansen, 2020). However, a challenge with such a structure lies in the increased pressure placed on the few managers who are now made to be responsible for a greater set of

employees. This shows that adopting a similar practice in large NPOs like the Qatar Foundation has the potential to foster a work environment that encourages creativity and change as managers feel a greater sense of authority. It also leads to a shorter path of information flow from the different hierarchies of management.

Another well-known example to reinforce the importance of management and administration innovation is the case of General Electric (Damanpour & Aravind, 2012). The company formed a dedicated industrial research laboratory to help instil management discipline amidst the chaotic process of scientific discovery. This helped the company obtain more American patents than any other competitor. Similarly, Damanpour and Aravind (2012) cite the example of Linux – a successful computer operating system developer – to explain how instilling an online collaborative environment was important to foster the rapid innovation seen in the overall product. These examples echo the earlier statement where management innovation is crucial and must be considered alongside process and product innovation to ultimately set the platform for the greatest chances of success.

2.2.4. Social innovation

There are a few conceptual ambiguities encountered in the process of defining social innovation which has brought about a diversity of definitions. These challenges complicate the processes of generalising the scope of social innovation, and related hypotheses, and theories about the precedence, antecedents, operational contexts, scalability and consequences of social innovation (Van der Have and Rubalcaba, 2016). There is a need for clarity in order for businesses and organisations to adapt their business models. A major issue with social innovation efforts is that most of them fail to achieve sustainability in the quest to enhance social welfare.

There has been no general agreement on the definition of social innovation in the academic field (Amanatidou et al., 2018; Edwards-Schachter and Wallace, 2017; Howaldt et al., 2014; Howaldt and Hochgerner, 2018; Van der Have and Rubalcaba, 2016). In order to create a definition relevant to the organisations and business research, the following criteria are essential. Firstly, it needs to be a solution-based innovation that has been implemented with enhanced social value; secondly, it needs to have followed a process of implementation; it needs to be understood that there are chances of failure.

The European Union through the European Commission understands social innovation to be a major tool for human empowerment and a driver for inclusive and sustainable social change (Fougere et al., 2017). One very popular definition of social innovation is “a novel, efficient, sustainable and more effective than existing solution to social problems whose value is directed at society as a whole (Phills et al., 2008).

The process of social innovation occurs in multiple scenarios at various levels of implementation. Those include firms, social multi-party networks and communities. With this variety of scenarios, there is the differentiation in the kinds of interactions and exchanges, legal and entity statuses such as public, private or public-private configurations (Garud et al., 2013).

2.2.5. Types of Innovation

Innovation results from diverse activities (Arundel et al., 1998). There are several different ways that business organisations can innovate. The variety of classifications, frameworks, models, and definitions of innovation types represented by different researchers make it difficult to understand the definitions of and relations between different types of innovation (Rowley et al., 2011). By narrowing the focus on a specific type of innovation, firms can be

more effective when conducting an innovation project. Trott (2012) provides a synopsis on the different types of innovation that is summarised in Table 2.

Table 2: Types of innovation and their categories

Type of Innovation	Application	Example
Product	Business	Development or modification and improvement of a product
Process	Manufacturing	Developing new process or technique in manufacturing
Organisational	Business/Administration	Internal communication system/ employee management system/New venture division
Management	Business/Administration	Total Quality Management Systems or Business process re-engineering
Production	Manufacturing/Industrial	Quality Circles/ Optimized manufacturing process/new production management systems/new monitoring and inspection systems
Commercial	Business	New sales campaigns or approach
Service	Technology	Financial and Accounting services offered via the Internet

(Source: adapted from Trott (2012, p.17))

A further classification is done by Keeley et al. (2013), who presented a model of different innovation types, which involves the whole innovation ecosystem, beginning at organisational processes and structures and covering important aspects of the newly introduced product or service. As shown in Table 3, they identified ten types of innovation categorised according to configuration, the offering, and the experience. The focus of the first four types of innovation (the configuration) is on the internal processes and practices of the firm. In general, these types of innovation are related to organisational resources and capabilities, such as structure or network as unique ways that create value. In the second

group (the offering), they consider the organisation's primary products/services, or a collection of its products and services. These types of innovation consist of new and improved products/services. Finally, in the last group (the experience), they introduce four types of innovation including brand/service innovation, which is customer-facing.

Table 3: Types of innovation

Profit Model	Network	Structure	Process	Product Performance	Product System	Service	Channel	Brand	Customer Engagement
CONFIGURATION				OFFERING		EXPERIENCE			

(Source: Keeley et al. (2013, p.13))

In order to build comprehensive knowledge on the antecedents of a high-impact innovation, and the successful management of innovation in organisations, it is vital to establish a clear knowledge of innovation types and understand their inter-relationships. As noted by Damanpour et al. (2009), innovation research suggests that every innovation type has different characteristics and effects. Therefore, to know the antecedents of successful innovation and effective innovation management, we explore attributes and determinants of each type of innovation.

After exploring different typologies and categorisations of innovation, this research will focus on three major innovation types, including product innovation (commercialising a significantly improved or completely new product or service), process innovation (presenting newly or significantly improved methods in organisation operations) and management innovation (newly introduced or improved management process and system or organisational methodology or operational practice), which has been used by many researchers such as Manual (2005) and Souto (2015) in the academic literature.

The reasons behind choosing these types of innovation are (i) the availability and the relation of these types of innovation projects within the case study (the Qatar Foundation), (ii) the fact that Qatar Foundation operates in a developing country, which might make it less capable of introducing radical technology, and (iii) being the most important and popular types of innovation, which usually all organisations are involved with. These types of innovation possess different characteristics and have characteristic patterns of diffusion (Edquist et al., 2001; Totterdell et al., 2002; Camison and Puig-Denia, 2016) and can be impacted in numerous ways by both organisational and environmental factors (Walker, 2007; Murat Ar and Baki, 2011; Prajogo and McDermott, 2011). In the following paragraphs, these types of innovation are discussed in more detail.

Product Innovation

Product innovation involves a firm's new product or service offerings (Knight, 1967). Product innovation is very common and has been widely discussed in the literature (Ali et al., 1993; Koufteros et al., 2007; Chen et al., 2010; De Medeiros et al., 2014). Product innovation consists of both products and services and is strongly linked to technological developments (Gunday et al., 2011). According to Manual (2005), product innovation involves a firm introducing new to the market or improved products or services. This includes improvements in technical specifications, materials, user-friendliness or other functional aspects.

Product innovation is also recognised as a significant strategic activity for business organisations (Atuahene-Gima and Ko, 2001; Hervas-Oliver et al., 2015). According to Roozenburg and Eekels (1995), both firms and industries benefit from product innovation as it contributes to firms output, which results in higher sales, profit, new knowledge, and industry growth. It is important to mention that product innovation is a complex process that

is fuelled by advancing technologies, dynamic customer requirements, increased competition and reduced product life cycles (Balachandra and Friar, 1997; Gunday et al., 2011; Cerdan and Nicolas, 2017).

Process Innovation

Process innovation is concerned with the variations to organisational operational and production processes (Knight, 1967). According to Gunday et al. (2011), based on this type of innovation, a firm implements newly introduced or improved manufacturing methods. However, it consists of newly introduced manufacturing methods, including new ways of handling a product commercially (Tavassoli and Karlsson, 2015). It is associated with fundamental equipment and technological changes (Gunday et al., 2011). Such innovation is recognised as critical for competitiveness (Adams et al., 2006), as it can be intended to increase quality, to reduce production unit costs or delivery, and to increase customer satisfaction (Manual, 2005). Furthermore, Reichstein and Salter (2006) argued that technological and organisational changes be involved in the process innovation activities. Such activities enable firms to reduce costs, to increase flexibility and to enhance the production process performance, which ultimately helps in developing and sustaining firms' competitive advantage.

Management Innovation

Management innovation is argued by Hamel (2006) to be critical to achieving competitive advantage. According to Birkinshaw et al. (2008), management innovation is "the invention and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organisational goals". In addition, prior studies have used different approaches to investigate the management innovation phenomenon.

Drawing upon Birkinshaw et al. (2008) two levels have been separated out. On one hand, at the broader level are management ideas, which Kramer (1975), has defined as "*fairly stable bodies of knowledge about what managers ought to do a system of assumptions, accepted principles and rules of procedure*". Total quality management, learning organisation and scientific management are forms of management ideas. On the other hand, at the operational level "management techniques, management practices, management processes, and the structure of the organisation" are identified as aspects of the rules and procedures followed within an organisation (Alange et al., 1998). Further, according Birkinshaw et al. (2008), management innovation productivity is associated with firms that are large, have a well-trained staff, interact with their internal and external knowledge sources and so on. Engaging with management innovation enable firms to achieve their goals, enhance their overall effectiveness (Birkinshaw et al., 2008), improve their performance (Mol and Birkinshaw, 2009) and develop competitive advantage (Barney, 1991).

These forms of innovation can be thought of as a subset of social innovation when applied in the context of NPOs, as they help the firms achieve their ultimate objective of satisfying the social objectives of the country. Additionally, NPOs need to look beyond their final products (product innovation) to their internal processes (process innovation) and management (management innovation) as a means of executing their projects in the most efficient manner. Even with the most innovative product ideas, process and management innovation is necessary to execute them in the best way possible and to enable the generation of more innovative product ideas in the future to keep a sustained competitive edge. Thus, this study looks at not only how the QF innovates in creating their social projects (product innovation) but also looks at how the firm manages its internal processes (process

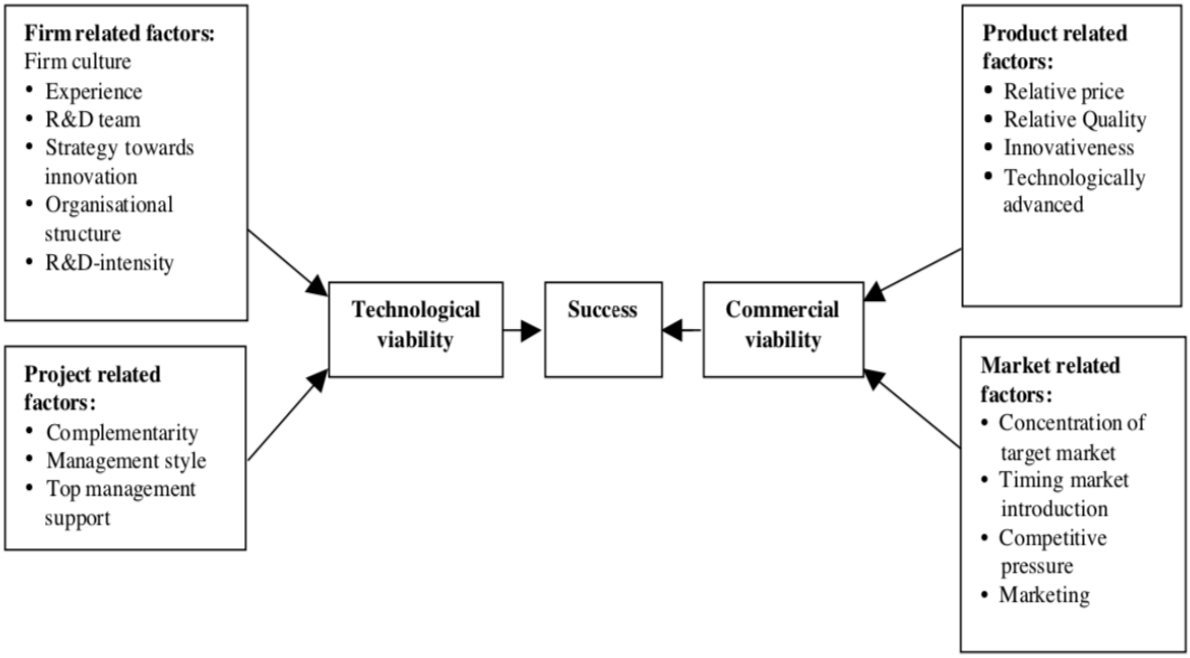
innovation) and management (management innovation) to best execute the various projects that the firm is involved in.

2.2.6. Successful Innovation Within Organisations

Many scholars (Gilbert and Cordey-Hayes, 1996; Walker, 2008; Cotterman et al., 2009; Rothwell, 2007) have investigated the determinants and cultures that drive innovation success within firms. What is being described mostly as a critical factor of success in the academic literature is the ability of the firm to recognise the value of internal capabilities and external information to use them for commercial ends. Triumph in innovation projects can be impacted by several contextual and environmental factors that surround each organisation (Roberts and Amit, 2003; Crossan and Apaydin, 2010). An objective of this research is to identify and classify the internal antecedents of a successful and impactful innovation. Therefore, we need to explore the different factors that can positively or negatively influence the innovation performance. This section explores some of the existing literature about the factors behind the success of innovation projects and discusses the scholars' findings of key fundamentals of successful innovation.

Panne et al. (2003) conducted a comprehensive literature review in order to examine success/failure determinants of innovative projects. Their review of the literature led them to a classification of factors affecting the viability of innovation projects, specifically, the technological viability and commercial viability. Based on their classification, they state that product, project, organisation, and market-related factors are the four factors that can affect the technological and commercial viability of innovation projects. Figure 1 presents the model they proposed, which illustrates the factors affecting innovation viability.

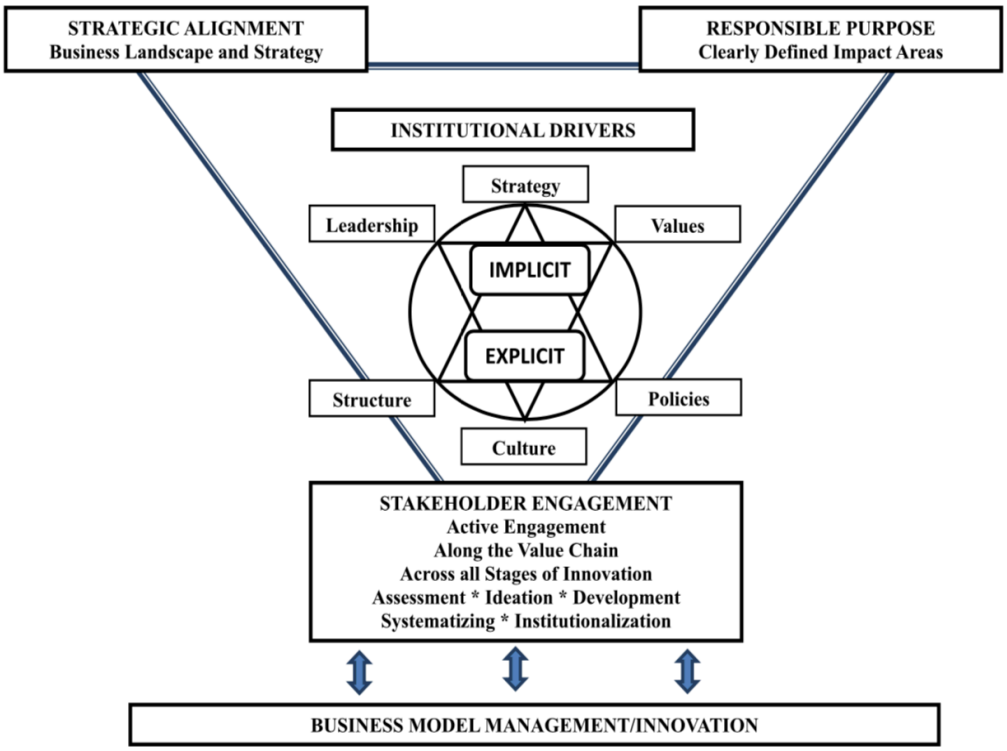
Figure 1: The roles of actors in user-involved innovation



(Source: Panne et al. (2003, p.313))

More recently, Herrera (2016) conducted research to represent a theoretical framework that describes factors leading to successful innovation in organisations. As shown in Figure 2, he has highlighted five distinct organisational elements including strategic alignment, institutional drivers, stakeholder engagement, responsible purpose, and business model management that influence successful innovations. He states strengthening and aligning these critical elements would increase the likelihood of successful innovations, improve corporate performance and enhance the business landscape. He has also indicated six institutional drivers including values, policies, culture, strategy, structure, and leadership that can either negatively or positively influence innovation activities in organisations. He argues that these factors are powerful sources of competitive advantage that can create an engine for business-model innovation.

Figure 2: Innovating for impact: Organisation elements



(Source: Herrera (2016, p.1727))

Panne et al. (2003) find that there are varying definitions and perspectives with regard to the relevance of factors behind successful and unsuccessful innovations. While some researchers may consider certain factors critical, others may find those very factors not as important and highlight a different set of factors to be critical.

In this research, the researcher adopts factors from studies conducted by Panne et al., (2003) and Herrera (2016) to develop the research framework. Although they have been initially proposed for conventional, profit-generating organisations by their respective authors, their application to NPOs is justified as the main differences between the two classes of organisations is in their overarching missions (McDonald, 2007). NPOs still have to consider the internal project and firm-related factors of innovation in a similar manner to conventional organisations, with the main difference lying in the extent of influence of the

respective antecedents owing to their differing operating objectives (McDonald, 2007). The two models form a comprehensive basis to study the factors that drive innovation and have been widely used to guide other studies in the field by authors including Dudau et al. (2017); Cherrafi et al. (2018); Millson (2015); Mirvis et al., (2016); Ucar (2018) and Yaseen et al. (2018) as they both provided a comprehensive and adaptable framework to investigate innovation management. As a vital domain of this research study is related to internal antecedents of successful innovation projects, in the next section these antecedents are discussed in more detail.

Internal antecedents of successful innovation

The subject of innovation project considerations or the key drivers of managers' decisions to exploit innovation has been the focus of much attention in the innovation literature (Barczak et al., 2009; Angel et al., 2013; Behrens et al., 2014; Behrens, 2016). Extant literature shows that different internal and external variables (De Medeiros et al., 2014) and barriers (Sandberg and Aarikka-Stenroos, 2014) are associated with the successful implementation of an innovation-oriented strategy. This research explores key internal antecedents of successful innovation and to examine their role in determining innovation performance. The following sections antecedents are divided into two categories, organisational antecedents and project antecedents.

Organisational factors for successful innovation

Innovating organisations are likely to experience different types of barriers and face several challenges, which are associated with internal corporate determinants. Many researchers have studied different organisational aspects such as organisational learning (Liao and Wu, 2010; Jimenez and Valle, 2008), organisational management and leadership (Jimenez and

Valle, 2008; Walker et al., 2015), organisational culture (Buschgens et al., 2013; Hogan and Coote, 2014), organisational structure (Flight and Palmer, 2013; Bennett and Parks, 2015), and organisational competencies (Chai et al., 2012; Todtling and Grillitsch, 2015) to understand the relationships of these variables with innovation performance. Existing literature has highlighted factors related to the organisation that influence the adoption and success of an innovation project. In the following sections, six key organisational variables that have been explored in the innovation literature will be discussed.

Vision and Strategy

A sustainability-oriented innovation strategy or an innovation-focused strategy effecting changes by will to a company's guiding principles influences the products, processes or practices in a firm, enabling them to create and realise economic, social and environmental value (Adams et al., 2016). As noted by Souto (2015, p. 152), "innovation represents more than just scientific and technological progress, it represents the development of new ideas relating to an organisation's practices, operations, and exploring new methods to operate". The innovation performance is largely related to the adopted strategy by firms. The main constituents are the relationship between the strategy of the innovation and the overall objectives of the firm; as well as a clear allocation of resources and a sustained and continuous commitment to innovation (Cooper et al., 2004; Adams et al., 2006). Hristov and Reynolds (2015) state that innovation is a fact of strategy for organisations and it should be driven by outcomes and linked to overall strategic vision with a collection of tangible steps and processes. In other words, the statement of organisational vision and strategy would develop and stimulate internal organisational drive to coordinate and collectively achieve set objectives (Bratianu and Balanescu, 2008). The clearer the firm's vision and strategy, the

better the facilitation of innovation, because it sets the pathway for focused development of newly introduced or improved ways of working, creativity, and risk-taking (Dobni 2008).

Formulating a clear organisational vision, mission, and strategy would impact the organisational innovation effectiveness (Donate and Guadamillas, 2011). The findings of Zhang and Duan (2019) show that from a strategic perspective, clear, well-communicated and understood vision and strategy of the organisation have a direct impact on innovation performance. Drawing upon Smith et al. (2008), corporate innovation strategies would not only have an effect on the management of innovation but would also have an effect on the employees' work. Therefore, it is important that they understand those strategies and be able to contribute towards achieving the organisation's strategic objectives (Pearson et al., 1989). Also, the implementation of innovation in firms needs clear strategic vision in terms of approach towards competitors, internal processes and external processes and the environment. Additionally, a firm's strategy needs to be in tandem with its selection of market orientation (Kekale and Kola-Nystrom, 2007). In other words, the vision and use of appropriate strategies for developing an organisation's innovation capability depends on the industry that the organisation is targeting (Husain et al., 2016).

Organisational Structure

Organisational structure has been referenced by many researchers (Rizova, 2006; Daugherty et al., 2011; Chen and Chang, 2012) as a critical factor for successful innovation within organisations. From the lens of researchers, different organisational structures can influence the innovation process in the organisation. For example, the classic hierarchical structure that usually impedes organisational learning can be deficient, to a level where informal structures like social networks, can build up and compensate (Rizova, 2006). The

matrix organisational structure that tends to set up the reporting relationships as a grid, or matrix, rather than in the traditional hierarchy, can suffer from information logjams, conflict, and confusion, with the overlap of responsibilities resulting in “turf battles and a loss of accountability” (Bartlett and Ghoshal, 1990). Therefore, the type of organisational design is critical for successful innovation as it creates and sustains a learning organisation in which individuals share knowledge willingly and quickly, a design that will successfully address the challenges of innovation flow within the organisation.

Organisational units use various coordination mechanisms to make advancements in their performance in light of their competitors. These are considered critical determinants to developing innovations (Jansen et al., 2006). According to Bennett and Parks (2015), organisational systems and structures can be critical barriers to innovation. They state that creating a structure that drives the right relationships and facilitates innovation is critical for the organisation to innovate successfully. Jansen et al. (2006) in their empirical study examined coordination mechanisms in two types of organisational structures: the formal hierarchical structure and informal social relations. Their study shows that formal hierarchical structures impact exploratory and exploitative innovation in different ways. For example, centralisation negatively influences exploratory innovation, while formalisation influences organisational performance positively.

Organisational Culture

Organisational culture is critical to the success of innovations (Buschgens et al., 2013; Hogan and Coote, 2014). The foundational roots of organisational culture lie in the value systems and beliefs that employees share in the organisation (Herrera, 2016). As pointed out by Buschgens et al. (2013), it has been a critical question for managers, practitioners,

and researchers what an innovation-stimulating culture should be within the organisation. Cotterman et al. (2009) conducted empirical research based on 32 successful technology companies to determine the best methods for introducing newly innovative products. They found that corporate culture, organisational structure, and market research processes significantly impact the success of innovations. They argue that cultural aspect business which assists, values, and acknowledges innovation within the organisation is crucial for the success in both incremental and breakthrough innovations.

Culture is certainly a major enabler of innovation in the current complex and dynamic business world. The culture of promoting innovation with a focus on human capital is one that most successful corporate innovation strategies are built upon (Gobble, 2016). In particular, an organisation's innovation success in the technological space is closely linked with its entrepreneurial drive (Atuahene-Gima and Ko, 2001; Collins and Smith, 2006; Ganter and Hecker, 2014). Smith et al., (2008) argue that the organisation's beliefs and values shape its culture which is reflected in the way the organisation functions and operates. Also, the influence of organisational culture on innovation management has been clearly stated as the management style reflects the organisation's culture.

Organisational Competence and Responsiveness

At an organisational level, the set of organisational competencies and skills is required to increase the chance of successful innovation (Martinez-Ros and Orfila-Sintes, 2009). The organisation needs this set of skills and competencies (e.g. human resources, networking, and knowledge) To achieve successful innovation for competitive success, these determinants will enable the organisation to respond to change and to handle risk, conflict, uncertainty, resistance, negotiation and changed circumstances more effectively (Gilbert and Cordey-Hayes, 1996). Therefore, successful innovation is highly dependent on the

organisation's provision of resources and capabilities, including access to finance, new techniques and technology, acquiring a skilled staff, understanding market needs, and establishing effective linkages across stakeholders (D'Este et al., 2012; Holzl and Janger, 2014). These form part of the challenges faced by nearly all organisations with a serious commitment to innovation. D'Este et al., (2012) argue that some of the difficulties involved have deterred some organisations from engagement in innovation activities and they remained locked into established routines. Some organisations do try to innovate and invest in innovation projects but may fail to implement successfully because they are unable to overcome resources and capabilities related difficulties after starting an innovation project.

Human Capital

Indeed, the organisation's human capital is the most critical factor in the innovation process (Gallouj, 2002; Sundbo et al., 2007; Bircan and Gencler, 2015). In other words, the human factor is the initial requirement for being an innovative organisation. Gobble (2016) defines human resources as an engine of innovation. Cotterman et al., (2009) state that the most significant feature of highly innovative organisations is their utilisation of human capital as a primary source of new internally generated ideas. On highly successful projects at innovative firms, the people are a critical and strategic component of successful innovation (Prajogo and Ahmed, 2006) through knowledge generation, assimilation, and application (Souto, 2015). Therefore, a high level of competence in the education and specific training of employees can be seen as a source of organisational competencies that builds a propitious environment for innovation. Therefore, as mentioned, researchers in the innovation field have generally agreed on the importance of human resources for innovation (Beugelsdijk, 2008; Podmetina et al., 2013; Gobble, 2016).

Knowledge Sourcing and Sharing

A major component of innovation is knowledge in its scientific, technological and sector-specific forms (Basadur and Gelade, 2006; Hjalager, 2010; Hernandez-Espallardo et al., 2011; Ye et al., 2016). Therefore, this important competency comes from the integration and utilisation of both internal and external knowledge sources in effective ways (Souto, 2015). Knowledge has been considered as a critical part of organisational capabilities, as it is necessary for both radical and incremental innovation. In other words, innovation within the organisation is composed of knowledge generation, acquisition, integration and application (Schoonhoven et al. 1990; Aranda and Molina-Fernandez, 2002; Asheim and Coenen, 2005). Todtling and Grillitsch (2015) examined the relationships of the sector and regional contexts with knowledge sourcing and innovation. By analysing evidence from seven European countries, they found that product, process, strategic, and organisational innovations rely on the sources of knowledge reaching from regional to global levels.

As noted by Gilbert and Cordey-Hayes (1996), the transfer of knowledge is a complex and dynamic process. It is an important part of the continuous learning process. Chesbrough (2007) stated that the process of innovation is not enshrined within the organisation boundaries and the organisation can find valuable sources of innovation externally, given the fact that successful innovation projects rely on both internal and external innovation sources. The notion of the learning organisation is accepted on the basis of one which is receptive and attentive that encourages learning to occur across the organisation. Therefore, it will be in a better position to have a continuous development and change, to react to internal and external effects, and to attain competitive success (Gilbert and Cordey-Hayes, 1996).

Recent studies such as Wang and Wang (2012), Hoarau and Kline (2014), Ritala et al., (2015), and Wu et al., (2016) also highlighted that the success of an organisation or enterprise is embodied in its efficiency of knowledge transfer as it is paramount for an organisation's innovation efforts. Zhou and Li (2012) conducted an empirical study to examine how organisations' innovation potential is affected by its knowledge depth, breadth and integration mechanisms (such as internal knowledge sharing and external market knowledge acquisition). They found that organisations' potential for innovation is enhanced in the presence of internal knowledge sharing and market knowledge acquisition. Rizova (2006) argues that understanding the interaction between informal and formal structures can help organisations to design and maintain effective learning conditions in which people exchange pertinent information and knowledge efficiently and willingly.

The earlier discussion indicates that there are some key organisational antecedents that drive innovation towards success if implemented and used in the right way. Those organisational antecedents have an impact not only on the innovation projects, but also on the management of innovation. This research has adopted the four factors that were highly recognised in research with their impact on the entire innovation process and its management. The researcher has adopted vision and strategy, and organisational structure, culture, competence and responsiveness. The human capital factor is adopted in more details and relevance to the following section which is the project related antecedents.

Project Factors for Successful Innovation

Gilbert and Cordey-Hayes (1996) argue that understanding of the issues and concerns that contribute to the successful implementation of innovation or technology are complex. In the last section, we discussed firm-related antecedents for successful innovation. In this section,

we focus on project-related antecedents. Many researchers have considered innovation context in organisations from the project-level perspective (Shenhar et al., 2001; Rothenberger, 2003; Tawiah and Russell, 2008; Nunez-Sanchez et al., 2012; Kim et al., 2015; Weiss et al., 2017). The project-related antecedents are associated with initial conditions, competencies, or alliance formation factors, which impact the innovation activities and performance within the organisation. To achieve in-depth understanding of antecedents of successful innovation projects in organisations, analysis would need to go down to the individual project-level rather than the whole firm-level because innovation activities are often conducted as part of R&D projects (Kim et al., 2013). The following sections discuss some of the key project related antecedents as the focus of this research study is on project-level.

Allocation of resources

One of the very important antecedents of successful innovation projects is the availability of R & D resources. Simply, innovation projects can be failed because of insufficient resource allocation and ineffective risk mitigation (Brook and Pagnanelli, 2014; Salerno et al., 2015). Availability of R & D resources and effective resource allocation are the most important factors to innovation success (Bunduchi, 2009). The senior management team approach in responding to requirements for resource allocation to both exploratory and exploitative efforts is important for a successful innovation (Jansen et al., 2008). Based on Salge and Vera (2013), empirical study, they have suggested that organisations that invest a high number of financial resources tend to have a higher rate of innovation. On the other hand, Li et al., (2012) argues that having huge free financial resources available, would result in investing in less effective projects whereas organisations that have limited financial resources are more committed to better utilise resources for effective projects.

Strategic allocation of resources holds substantial significance to execute successful innovation in an organisation. This is because the higher the financial resources allocated on innovation projects, the higher the sales of new products/services can be reaped by firms (Janger et al., 2017). In this concern, the role of senior management is critical as they are involved in steering successful innovation projects. The strategic decisions about the allocation of resources in innovative projects are to be made by managers to improve organisational competitiveness (Unger, 2012). It is worth noting that improved investments in R & D possess the high propensity to bring innovative products which later improves organisational performance (Haapanen et al., 2018).

Time Availability

The development of new products is a risky and complicated process in terms of time consumption (Kach et al., 2012; Yang et al., 2020). The time available to the R&D team is an important factor that can influence various team activities (Kim et al., 2015). Anderson et al. (2014) state the availability of time as a component of the non-physical working conditions that influence the performance, creativity of employees and overall organisational innovation. Studies conducted on the impact of time pressure on creativity and innovation — as one of the factors of organisational innovation climate — yielded mixed results. Baer and Oldham (2006) reported that employees' creativity became higher when their creative time pressure was intermediate. Ohly and Fritz (2010), however, reported that time pressure as a challenge-related motivator increased creativity and proactive behaviour among employees, leading to favourable outcomes. Hsu and Fan (2010) further discovered that time pressure moderated the link between organisational innovation climate and creative outcomes when utilised as a regulator.

Peeters and Potterie (2006) examined the barriers to the innovation process. Their findings suggest that time constraint is one of the major obstacles to organisations' innovation performance. Further, drawing upon Lindskog et al. (2017), time pressure could hinder managing the innovation process and results in less desired outcomes.

Leadership

Senior leadership or decision-makers in the organisation have a unique and essential part across the entire process of an innovation project. They play a significant role in making innovation projects run efficiently and smoothly (Cotterman, et al., 2009; Ford et al., 2010; Camelo-Ordaz et al., 2015). Leadership is a critical constituent for innovation project success which organisations possess as an edge and has a significant effect on unitary or collective project innovation (Li et al., 2016). Further, effective leadership has a huge influence on the process of innovation as it shapes and influences the way the organisation operates and the way the employees are encouraged to be more innovative (Pearson et al., 1989; Rivas and Gobeli, 2005; Smith et al., 2008). Studies of researchers such as Mumford and Licuanan (2004), Tellis et al. (2009) and Rosing et al. (2011) reinforce the importance of leadership in establishing and developing a supportive culture for innovation. Herrera (2016) argues leadership reinforces the corporate culture and defines leaders as a tangible referent for desirable values and attitudes. Leadership can increase the chance of successful innovation activities by modelling behaviour to enhance the acceptability of new discoveries and inventions within the organisation in a more supportive and positive disposition (Cotterman et al., 2009).

Quality management systems on innovation have been referenced in recent academic studies (Helfat and Peteraf, 2015; Camison and Puig-Denia, 2016) as it emphasises the

significance of leadership at the management level in driving innovation and the cultivation of a standard attitude among all stakeholders of an organisation to achieve success in innovation. Fritz et al. (2011) argue that the implementation of a quality management system is essential for an organisation to become highly adaptive and receptive to innovation.

Top Management Style and Managerial Characteristics

Several studies conducted on the human side of the decision-making in innovation processes suggest that managerial characteristics are significant for the decision-makers. The literature emphasises the importance of a number of managerial characteristics such as experience (Klaukien et al., 2012), entrepreneurial capabilities (Blauth et al., 2014); risk-taking behaviour (Laux, 2015; Edwards-Schater et al.,, 2015); creativity skills (Rego et al., 2007; Sousa et al., 2012) on the decision-making in innovation projects. It has been proved that the managerial variables can be a significant predictor of incremental innovation (Koberg et al., 2003), giving managers' decisions and perceptions are based on their cognition and experience (Tikkanen et al., 2005; Klaukien et al., 2012).

Managerial practice, style, incentives, and working arrangements have been mapped on to the critical factors for organisational innovation (Leonard-Barton and Deschamps, 1988; Lin et al., 2010; De Visser and Faems, 2015). Researchers suggest that top executives' personal traits such as their behavioural inclinations and cognitive instincts often greatly influence the ability of an organisation to venture into novel explorative activities (such as experimentation, variation, flexibility, risk-taking and new discovery) and exploitative activities (such as identification, selection, production, efficiency, execution and implementation) innovation activities (Hambrick et al., 2005; Papadakis and Bourantas, 2007; O'Reilly and Tushman, 2008; Mom et al., 2009). The findings of a recent study by De

Visser and Faems (2015) show that “analytically cognitive CEOs tend to engage more in activities related to exploitation of existing products and markets, whereas intuitively cognitive CEOs tend to engage more in activities related to exploration of new products, services and markets” (p. 360).

Lin et al. (2011) conducted empirical research based on a survey of more than a thousand Chinese private manufacturing firms from 2000 to 2002 to evaluate the role of CEOs’ characteristics and their managerial practices in organisational innovation projects. Their findings have three important conclusions. First, the presence of CEO incentive schemes within the organisation boosts its commitment to innovation and improves innovation outcomes. Second, sales-oriented performance measures in the incentive scheme are more suitable as compared to profit-based performance measures to an organisation's innovation activities. Third, The CEOs’ professional profile and experience, such as education level, professional background and political connections, are positively associated with the organisation’s innovation efforts.

The findings of Bruneel et al. (2012) present the significant role of an organisation’s executive and top management in radical innovation projects. It shows the necessity for an organisation's executive management to participate actively in the project’s development. Also, “*it is important for the innovation project leader to communicate the project effectively to top senior leadership and to create a competent team*” (p. 953). Bunduchi (2009) noted, “*an absence of a serious commitment from top management delays access to resources which leads to low innovation project development efficiency*” (p. 543).

Employees and Cross-Functional Teams

Skilled human capital and technical talents, in particular, can benefit innovation projects and the overall innovative organisations in different ways. On the one hand, people with deep technical expertise and skills are able to facilitate communications as they can speak and translate different “technical languages” in workplaces, significantly easing the flow of information (Rizova, 2006). Having these critical skills help to minimise individuals’ misunderstandings and duplications of tests and procedures, which is conserving both resources and time, ultimately leading to greater efficiency (Rizova, 2006; Cheng et al., 2008). On the other hand, having skilled and talented people, which Rizova (2006) names “technical stars”, help create a much-needed sense of stability. For instance, in critical situations, these technical stars are looked upon as effort and time savers, as efficiency executives and as “*islands of sanity*”. Furthermore, on high-profile projects with strict time frames and financial budgets, which failure is not an option, highly qualified labour contributes to enterprise’s strategic orientation and innovation (Podmetina et al., 2013). Also, a good technician or engineer is better able to control the process and to determine what might work and avoid wasting time pursuing technological dead ends (Rizova, 2006).

Furthermore, successful organisations in innovation utilise cross-functional teams that participate in idea generation processes and demonstrate serious commitment to the innovation project than with their organisational designations. Successful firms try to align vibrant work ethics and linkages with functions of different departments in the organisation and utilise R&D and market inputs in designing the innovation project targets (Cotterman et al., 2009). One of the important roles of successful managers is the ability to build an organisational environment that optimally supports entrepreneurial behaviour and creativity by employees. A practice that includes the commitment and collaboration of employees across different hierarchical levels within the established organisation (Bruneel et al., 2012).

Teamwork is another project environment antecedent for successful innovation. Highly innovation-oriented organisations that achieve both radical and incremental innovation have developed common practices that function well in diverse cross-functional teams to support the momentum for novel innovation (Cotterman et al., 2009). Basadur and Gelade (2006) point out teamwork as an effective infrastructure that boosts innovation performance within organisations. Innovative firms try to apply an organisational climate, which brings different perspectives together and supports the development of new ideas (Fay et al., 2015).

Kach et al. (2012) analysed the development of successful high-novelty innovation projects under strenuous circumstances and schedules. They defined the successful innovation projects in terms of the efficiency of design and engineering, manufacturing and product delivery, functionality, and positive commercialisation. They found that the influence of visionary leadership, project momentum and teamwork play a key role in how a high-novelty new product development project achieves successful completion. As innovation is a complex process, there is a high-level of interdependency among the project team members, emphasising the importance of effective collaboration (Ko et al., 2011). Zhou et al., (2013) emphasis on collaboration oriented HRM systems in innovative firms. They state that it contributes immensely to creating the cognitive, structural and relational linkages for exploring new, non-redundant ideas, information, and knowledge, which are critical resources for innovation.

It can be concluded from the earlier discussion that project related antecedents are very important for driving innovation projects success. Without having enough resources innovation projects can’t run smoothly. Also, having realistic time available would enable the process. All human parties such as senior leadership, top management, employees and teams are the key drivers for innovation projects’ success. This research has adopted these

project-related antecedents into the developed framework. The researchers have categorised all the human antecedents under human resources.

2.2.7. Innovation Process Stages/Innovation Value Chain

Although its application is fairly new, Innovation Value Chain (IVC) originates from two main ideas; they are: (i) that innovation is a process and (ii) the value chain work proposed by Porter (1985). For example, early scholars such as Zaltman et al., (1973) proposed initiation and implementation as the two stages of the innovation process. Whereas Porter (1985) defined an organisation's value chain as a linkage of five primary activities and other support activities that lead to the creation of value for customers. This definition was supplemented by works of Norton and Kaplan (1996) who defined the value chain from an intra-organisational perspective, proposing a new trifold process (innovation, post-sale services and operations) that form the value chain. The early scholarly work of Porter (1985) provided the foundations for more expanded definitions of the value chain by scholars such as Van Horne et al. (2006). Van Horne et al., (2006) defined the value chain as a series of primary activities beginning with need identification, applied research, innovation development, commercialization, diffusion, and adoption and their support activities which include competency management, infrastructure management, and knowledge management.

Hansen and Birkinshaw (2007) presented the innovation value chain (IVC) as a three-stage process that involves generating, developing and diffusing ideas. This idea of the IVC was developed from five large research projects that the authors conducted over the period of 10 years. The output of this was a model which identifies and suggests a defined and integrated route of converting ideas generated to tangible commercial outputs (see Figure 3 below).

The researcher in this study has adopted the IVC model as a three-stage of innovation into the research framework to investigate the phenomena and how they can enable the success of innovation projects. The IVC model has been used by many researchers such as Gamal et al. (2011); Yokomizo et al. (2013); Taghizadeh. (2014); Mbassegue et al. (2015) to build an innovation framework which can help to assess innovation projects in different types of industries, with the same purpose, evaluating management innovation, a framework was adopted in this research also. The following paragraphs discuss these three key stages of the innovation value chain in detail, citing both older and more recent literature.

Figure 3: A defined and integrated route of converting ideas generated to tangible commercial outputs

	IDEA GENERATION			CONVERSION		DIFFUSION
	IN-HOUSE Creation within a unit	CROSS-POLLINATION Collaboration across units	EXTERNAL Collaboration with parties outside the firm	SELECTION Screening and initial funding	DEVELOPMENT Movement from idea to first result	SPREAD Dissemination across the organization
KEY QUESTIONS	Do people in our unit create good ideas on their own?	Do we create good ideas by working across the company?	Do we source enough good ideas from outside the firm?	Are we good at screening and funding new ideas?	Are we good at turning ideas into viable products, businesses, and best practices?	Are we good at diffusing developed ideas across the company?
KEY PERFORMANCE INDICATORS	Number of high-quality ideas generated within a unit.	Number of high-quality ideas generated across units.	Number of high-quality ideas generated from outside the firm.	Percentage of all ideas generated that end up being selected and funded.	Percentage of funded ideas that lead to revenues; number of months to first sale.	Percentage of penetration in desired markets, channels, customer groups; number of months to full diffusion.

(Source: Hansen and Birkinshaw (2007, p.123))

Idea Generation

Stemming from early research on organisational and individual creativity, there has been a build-up of literature on idea generation. In the 70s, researchers like Twiss (1974) suggested that firms that have made a success of innovation have a supportive culture and orientation that's fosters the development and establishment of new and creative ideas. Literature shows that both small and large companies have the capacity to generate creative ideas (mostly through their R & D teams). For instance, Hamel (1999) posits that larger companies can generate creative ideas that can match those of smaller Silicon Valley companies if their organisational hierarchy doesn't interfere. This section considers the idea generation aspect of the innovation process.

Early literature suggests that three key factors make influence idea generation aspect of the innovation process. These are segregation, structure and strategic intent.

Segregation **–** Osborn (1963) and Rickards and Freedman (1978) are examples of key scholars that posited that idea generation is a multi-faceted concept that needed to be individually evaluated in the sum of its parts. They worked on the segregation of idea generation. This largely means that generating ideas should be regarded as a separate activity from evaluating ideas. The work of Maier (1963) revealed that separating idea evaluation and idea generation can ameliorate the process overcoming obstacles. The work of Rickards and Freedman (1978) emphasised on adding a time interval in the idea generation phase (in order to foster creative thinking) before entering the idea evaluation phase.

Structure **–** Structures are key to developing ideas in the organisation. Early researchers such as Osborn (1963) developed brainstorming as an idea to note down, checklist, discuss,

and enhance ideas. Seaker and Waller (1996), Rickards (1999) and Titus (2000) suggested that idea generation happens in a cyclical manner where old ideas can be regenerated and applied to appropriate circumstances.

Strategic intent – The development of new ideas in a company has to be aligned with the strategic intent and objectives of the organisation (Guimaraes and Langley, 1994). It is therefore crucial for individuals engaged in idea generation to be aware of and appreciate the goals, strategy and vision of the organisation (Amabile, 1998).

More-recent literature considers other aspects to be critical to idea generation. Hansan and Birkinshaw (2007) suggest that new ideas can be generated both internally and externally. Internal idea generation happens through cross-unit collaboration. They consider cross-unit collaboration as critical to the idea generation phase of innovation. *Cross-unit collaboration* primarily centers on integrating ideas, insights, knowledge and learning from different units or departments of the company. The sole aim is to be able to develop new products and markets without being limited by organisational structures. In organisations with decentralised structures or staff geographically distributed, it is difficult to coordinate ideas across people.

Idea conversion

How you handle your ideas can say a lot about the success of your innovation process.

New ideas will not be proper without screening and financing mechanisms. In numerous organisations, strict funding criteria, tight budgets and conventional thinking contribute to the lack of innovation and expression of the ideas. Members of the organisation rapidly get the message, and the ideas stop flowing inside of the organisation (Hansen and Birkenshaw, 2007).

Idea conversion concerns the processes associated with converting new ideas into innovation. Hansen and Birkenshaw (2007) suggest that firms need to manage the selection and eventual development of these ideas. They also refer to idea conversion as to the selection process. The process of selection is followed by developing ideas into new products and services, which they refer to as developments.

Hansen and Birkenshaw (2007) made observations of different organisations and came to the conclusion that managers do not take idea screening seriously enough, this is where organisations get overflowed with new projects from which many do not fit into the corporate strategy of the organisation. There are multiple methods of idea selection. Creativity workshops, such as brainstorming, creativity contests and design jams are popularly adopted by organisations to explore new ideas for products, processes and services. The selection of ideas resulting from these creative processes is vital for firms looking to innovate, as it provides the foundation for key decisions on time and financial management. Additionally, selecting the right ideas has a greater bearing on the impact of the creative process and thus the overall innovation process (Gabriel et al., 2016).

Ozer (2005) in his study introduces a new product idea selection method. The new method offers general guidelines for managers to follow in new product idea selection. The method consists of eleven different analyses that are: marketing, financial, organisational, strategic, relationship, industrial, competitive, similar case, consumer and consumption, expert and technical analysis. The approach focuses on different aspects of the new product idea selection to minimize the risk of failure.

Idea diffusion

Idea diffusion concerns disseminating developed ideas within and outside the organisation. In order to achieve that, it is critical to understand the complexities associated with the innovation process and idea diffusion methods. Depending on the type, size and source of innovation, the diffusion model and method may differ. Different approaches and perspectives apply to different innovation diffusion processes.

Early studies of Damanpour and Gopalakrishnan (1998) and Rogers (2003) indicate that the spread and diffusion of ideas and indeed innovations within organisations happens through generation and adoption. Generation concerns ideas and innovations that are to be utilised within the firm they've originated from. Adoption, on the other hand, regards innovations that have an external source but are imported for internal applications.

Other researchers emphasized that the process of idea/innovation diffusion that is generated in-house involves a number of stages, namely idea generation, project definition, design, development, and marketing and commercialisation (Cooper and Kleinchmidt, 1990). In terms of the diffusion of ideas/innovation, which have been developed outside the organisation, the key stages include awareness of the idea/innovation, formation of attitude, idea evaluation, decision to adopt, pilot implementation, and final implementation (Zaltman et al., 1973).

Deichmann et al. (2020) elaborate on reasons why some ideas diffuse successfully while others remain unsuccessful. They address the issue by looking at characteristics of the idea and connectivity of the idea to the content network, the words that ideas have in common. Results of the study highlight that the high connectivity of an idea with the words that ideas

have in common is beneficial for idea diffusion since it appears as more familiar to the people.

2.2.8. Innovation Performance

A significant portion of the innovation literature concerns the performance of innovation and how innovation performance can be measured. One of the primary objectives of innovation processes is the improvement of organisational performance (Damanpour et al., 2009; Walker et al., 2015). This means that innovation processes largely result in organisational change and adaptation in order to foster and facilitate the achievement of set organisational targets, goals and objectives. This becomes increasingly important in an ever-changing and dynamic marketplace, increasing competition, scarce resources and higher consumer expectations (Roberts and Amit, 2003; Jansen et al., 2006). In that regard, the definition and assessment of project and innovation success and performance is considered a key strategic factor that aligns organisational objectives with project efforts (Shenhar et al., 2001).

The question about how innovation is measured is one that has been a core area of focus for innovation researchers. There have been numerous metrics and measures proposed and varying methodologies to validly measure or assess innovation (Tohidi, 2012). Over the years, numerous measures have been proposed for measuring organisational innovation performance have resulted in different methods, techniques, and frameworks being developed. However, Thamhain (2003) suggests that there is a great deal of complexity in measuring innovation performance. He proposed a number of metrics which can be used as indicators of innovative performance. Damanpour et al. (2009) suggest that the influence of innovation on organisational efficiency is dependent on different innovation categories. As the last section of the research framework is related to innovation performance, a set of

subjective and objective metrics for measuring innovation projects will be applied to evaluate the performance of each innovation project with different antecedents and innovation management process.

2.2.9. Innovation and NPOs

Although the majority of studies look at the relationship between innovation and conventional organisations, there have been studies that explain the need for innovation for NPOs and the impact innovation has on the projects that they embark on. For instance, Reficco et al. (2020) find that NPOs are severely bottlenecked by 2 concurrent factors: the lack of access to reliable funds the difficulty of expanding to a large scale. They must thus innovate to enhance the chances of survival and execution of projects in the most efficient way. They propose the use of Business Model Innovation (BMI) to formalise this proposition and assessed their claims in a retrospective case-study application on a well-known NPO, UNIDO. Their findings showed that UNIDO effectively used BMI to transition from a donor-reliant NPO to a self-sufficient sales-driven Social Enterprise (SE). An analysis of their BMI model shows that the NPO effectively implemented a change in organisational structure – management innovation – to give project leaders more autonomy and ultimately achieve their goals in an innovative way. Although promising, their study relied on retrospective interviews on employees working for the NPO which can bring an element of error into the data collection process.

Rey-Garcia et al. (2019) aim to find the sources of competitive advantage for NPOs that make use of Cross-Sector Partnerships (CSPs). This study deals with social innovation in a general sense by considering it as a manner in which innovation is applied to solve social causes and pressing social needs. They find that the following factors potentially hinder the level of social innovation in an NPO: a hierarchal commitment, collaboration across projects

and managerial efficiency. From this it can be deduced that social innovation in NPOs is not well understood. It is a complex topic that typically deals with several inter-dependent factors at the same time and a further exposition is needed. Westover and Wagner (2010) re-iterate the importance of social innovation for NPOs to guarantee survival and go further to study the ways with which one can measure the performance of NPOs. They conclude that there is no universally acceptable measure of NPO performance, although commonalities in the performance metrics include strategic value, effectiveness, financial value, importance to key stakeholders and marketing value. The results of this study show the complexity of measuring NPO performance as they all embark on different social causes and are all pivotal to their countries for different reasons.

Krasnopolskaya and Meijs (2019) investigate the factors that are associated with the capacity of Russian NPOs to yield Social Innovation (SI). A regression analysis using a sample size of 850 Russian-NPO employees show that the crucial factors for achieving meaningful Social Innovation include cross-boundary collaborative relations, volunteer involvement and the diversity of revenue structure. They also find that large NPOs are likely to be innovation-centred owing to the policies in the country. This study demonstrates the prevalence of Social Innovation (SI) in large, Russian NPOs along with an exposition as to what potentially enables them to continue to flourish. Andreasen (1982) shows that many NPOs face financial difficulties due to rigid operating practices and demonstrates the need for NPOs to be innovative with a focus on the needs of their intended customers and how to solve them in socially innovative ways. This further shows the need for innovation in the context of NPOs.

2.2.10. Studies Related to the Qatar Foundation (QF)

Qatar has been a country with an increased research focus owing to its rapid modernisation seen in recent times (Mohtar, 2015). The Qatar Foundation (QF) has been instrumental to this modernisation as it has been the underlying driver of various social causes in the country including the development of education, health and other social services. There has been well reputed literature presented to explain its importance to the development of the country. For instance, Mohtar (2015) identifies the QF as being a key factor in the development of the country by focusing on education and moving towards a knowledge-driven economy and embarking on innovative projects. There have been various related projects completed by the QF including the Education City, Arab Expatriate Scientists Network and the Qatar National Research strategy that are all testament to the firm's importance to the country as it embarks on a journey towards a knowledge-driven country (Mohtar, 2015). This importance on education is reiterated by Crist (2015), whose study found that the educational efforts embarked on by the QF have been crucial towards the rapid development of the country. Moreover, Owens (2015) explains how the QF has been important to the country in its National Vision of 2030 where Qatar aims to be a knowledge-driven and innovative economy focused on being the regional leader in education, research and the arts and sciences.

Another important contribution of the QF towards the development is through the development of the healthcare system. Koewn et al. (2014) propose a framework to explain the diffusion of innovation in healthcare-related projects. The application of their framework to the Qatar Foundation as an example found that the organisation has been pivotal to the country from a healthcare perspective owing to a high ranking of the enabling factor, "vision and strategy." Additionally, a qualitative survey of healthcare professionals from a cross-

section of 8 countries showed that the Qatar Foundation ranks highest in the cultural dynamic of improving the next journey of system transformation (Keown OP et al., 2014). This study clearly shows the prominence of the foundation towards the development of healthcare in Qatar and more importantly, the emphasis the organisation places on innovation as seen from the point of view of the members. The importance of the QF towards the healthcare of the country is also shown by Brown et al. (2012), where a combination of the innovative Qatar National Vision 2030, the National Health Strategy and the National Cancer Strategy put the country well ahead of its neighbouring peers in terms of early cancer detection – a common disease in the Middle East. These 3 healthcare projects are embarked on by the QF concurrently and reveal 2 important things: the organisation works on a wide array of projects and that it pursues them in a highly innovative way when compared to its neighbours.

While it is clear that the QF is innovative and is pivotal to the development of Qatar by embarking on social causes – most commonly healthcare and education – there is no reputable literature presented that investigates the antecedents of this innovation. This clearly highlights a knowledge gap that this study aims to position itself to fill.

2.3. Developing a Research Framework

Earlier sections of this chapter presented several factors that affect the success and impact of innovations. These factors include the provision of resources and strengths which constitute access to finance, improved quality of hired staff, a better understanding of the market and enhancing the connectivity with relevant stakeholders (D'Este, et al., 2012). Organisations cannot achieve successful innovation efforts in their projects without the

consideration of the antecedents of successful and impactful innovation activities. These antecedents must be carefully studied, and innovation should be understood as a continuous and dynamic process with various phases each of which has peculiar requirements, and the entire process needs proper management for successful innovation activities. While a review of the various studies (both empirical and theoretical) on the factors causing the successes and failures of innovation efforts was presented in the previous chapter, (Balachandra and Friar, 1997; Astebro, 2004; Cheng et al., 2013; Bouncken and Fredrich, 2016), numerous innovation efforts fail due to problems associated with the conception and delivery of the innovation projects and subsequent introduction to market (Cooper, 2011; Evanschitzky, et al., 2012; Sandberg and Aarikka-Stenroos, 2014; Jones et al., 2016). The primary focus of most studies conducted on innovation has either been on the process (Brophey et al., 2013; Salerno et al., 2015) or the outcome (Awate et al., 2012; Nieves, 2016). Meanwhile, with the various complexities of innovation processes, their success and outcomes further depend on a myriad of complex factors that require further study and understanding. This is lacking in the extant literature as highlighted earlier in this chapter. Therefore, a comprehensive framework to enable the critical study and understanding of the complex factors associated with innovation from the inception of ideas (idea generation) to the commercialisation of the innovation project is highly required to enable the proper management of the innovation project. This study proposes such a significantly important framework.

The purpose of the framework is to propose a methodical approach towards answering the research question (Section 1.5) and provide a basis for the investigation and assessment of the antecedents of successful innovation in organisations. It will further provide a context

under which the theoretical perspectives adopted will attempt to answer the research question previously posed.

2.3.1. Defining and Analysing the Framework

The characteristics of such conceptual frameworks have been previously outlined by many scholars and researchers (such as Imenda, 2014; Saunders et al. 2012; Lauffer, 2011; Jabareen, 2009; Miles and Huberman, 1994; Swanson and Holton, 1997; Guba and Lincoln, 1994). It was earlier defined by Jabareen (2009) as a collection of concepts that constitute a connected approach towards the critical study and understanding of a problem or phenomenon. The individual concepts are closely related to provide a complete philosophy which further provides ontological and epistemological significance. Guba and Lincoln (1994) put forth that the ontological significance is with respect to certain assumptions and knowledge of aspects of reality such as “the way things are”, ”the nature of reality”, ”real” existence and “real” action while the epistemological significance is with respect to the assumptions such as questions of “how things really are” and “how things really work”. The process of developing the framework itself and its ability to interpret the “real” world constitute the methodological assumptions.

Unlike quantitative models, conceptual frameworks offer an approach to achieve understanding of the phenomena being studied rather than just theoretical interpretations. This position presented by Jabareen (2009) agrees with Levering (2002), who expressed that conceptual frameworks offer “soft interpretation of intentions” but not “hard facts”. He added that they do not allow for the prediction of outcomes due to their indeterminist nature.

The proposed conceptual framework is to be guided by relevant theories and literature and is expected to provide an avenue to study variables that affect innovation including

antecedents of innovation, management of innovation, and performance of innovation. The conceptual framework will contain three different sections (antecedents of innovation, stages of innovation, and performance of innovation), all of which will be explained in greater detail in succeeding sections. In addition, the theoretical approaches and perspectives to study innovation projects within the case study organisation (The Qatar Foundation) will be explained. Finally, the research question and problem statement leading this study toward a multi-theoretical approach, which allows for conceptualising and empirically assessing the antecedents of successful and impactful innovation for firms involved in innovation activities will be explained.

The research framework guides the categorisation of internal key factors as antecedents associated with a successful and impactful innovation for firms involved in innovation activities. The framework provides a theoretical foundation for the empirical investigation of the research question.

2.3.2. Theoretical basis of the research framework

Resource-Based View (RBV)

The Resource-Based View (RBV) has a long history of presence in strategic management literature right from time of early invention of the theory by Wernerfelt (1984) and Barney (1991). The growth and advancement of the RBV theory is closely tied to some research areas such as organisational economics and strategy. In the strategy research, Truijens (2003) indicates that the RBV theory varies in the manner in which it explains firm performance. However, it has been successful in generating significant attention to competences and capabilities at the firm level. On the other hand, in organisational economics, research shows that RBV has incorporated the transaction cost theory and the

agency theory as well as other theories and continues to benefit from their extensions connected to practical outcomes of RBV (Truijens, 2003). In this context, the agency theory identifies the resources with prospects to help a firm gain competitive advantage. The transaction cost offers better comprehension of not only the origin but also the varying structures of markets for exchange of external services (Habbershon and Williams, 1999).

The variable of RBV makes key assumptions that firms are heterogeneous: immobile, idiosyncratic, inimitable and often intangible resources provide an opportunity for a firm to cultivate competitive advantage as well as increased performance (Habbershon and Williams, 1999). In essence, RBV explores the connection between external processes and features of the firm and its performance. Helfat and Peteraf (2003) expound this concept further by affirming that RBV explains competitive heterogeneous nature based on the assumptions that competitors exhibit differences in their capabilities and resources.

According to Miles (2012), the RBV theory focuses on performance differences across organisations. It is based on two primary assumptions: (1) different firms within the same industry have different resources and capabilities, and (2) their capabilities are immobile. The primary basis of the RBV theory refers to the competencies that are capable of providing a clear competitive edge are more difficult to accumulate in comparison to the tangible factors of production (Leiblein and Madsen, 2009). In other words, the focus of this theory is the heterogeneous nature of competencies throughout the firm and stresses how vital valuable, non-substitutable, rare, and inimitable resources and capabilities are to firms looking to improve their effectiveness (Bryson et al., 2007). The RBV theory suggests that complementary resources and capabilities support the firm in innovating (Christmann, 2000), improving the impact of innovation on organisational performance (Damanpour and Schneider, 2009).

More recent publications on RBV have largely focused on providing research frameworks that consider firm resources and capabilities in determining innovation potential. In that regard, Kim et al. (2015) investigated the effect of internal resources and capabilities on service innovation using a research framework they developed. The research framework used the RBV model in defining an organisation's internal resources and its relational capabilities. Their findings highlight ways firms can become more resilient in a dynamically changing market, through the introduction breakdown of dynamic service capabilities into three identifiable and distinct processes that enable resources and relational capabilities to affect components of service innovation. Similarly, Vicente et al. (2015) have worked on assessing the innovation capability and capacity of firms. Their study focussed on exporting firms and developed a scale which measures innovation capability of exporting firms and uses three measures of export venture performance (financial, strategic, and achievement) to gauge the impact on the firm.

Recent research efforts are also exploring questions about the antecedents and performance outcomes of innovation. Zhang and Duan (2010) investigate the link between innovation ambidexterity and performance outcomes. The study used the dynamic capabilities theory to develop a theoretical framework which explores interconnection between human resource management (HRM) and entrepreneurial orientation (EO) on innovation ambidexterity. The theoretical model was tested using a survey of Chinese industrial firms, with the results indicating that there is a relationship between EO and capability based HRM on innovation ambidexterity.

With regards to firm performance, Prange and Pinho (2017) developed a conceptual model to identify the impact of individual and organisational internal drivers on SME firm performance. They draw on the RBV theory and conducted a survey of 121 firms in Portugal

to explore the importance of innovation for capability and resource deployment during internationalisation. Their findings suggest that drivers possess a direct positive link with the organisational efficiency, and relationship can mediate through organisational innovation.

More-recent studies that have utilised the RBV include Plank and Doblinger (2018), which use the theory to study the impact of funding R&D projects in firms through public funds. The paper examines over 200 publicly funded R & D projects in the German renewable energy sector, including 3900 patents and 8500 patent citation across 1448 firms. The paper contributes to extant literature on the interaction between RBV and firm innovation, particularly by providing insights into the importance of financial, physical and intangible resources to firm innovation.

The researcher draws from the RBV framework to identify such antecedent and management factors that affect innovation activity and lead the organisation towards a successful and impactful innovation. RBV was chosen because it enables the analysis of innovation from both organisational-level and project-level, as it is linked to both physical and organisational space. In addition, on both levels, internal competencies are key antecedents for successful innovation. RBV aims to understand how firms utilise dynamic capabilities/resources and capabilities to attain and retain a competitive edge over their competitors by becoming dynamic and responsive to changing environment (Miles, 2012). Therefore, in the context of this research study, we assume that the Qatar Foundation adapts to the external pressures by attaining and maintaining distinctive competencies that support the organisation to maintain high performance in the society.

Dynamic Capabilities Theory (DCT)

Although some prior work on the dynamic capabilities was done, it was not until Teece et al.'s (1997) article was published that the theory got an increasing amount of research interest. Over the years, the DCT became a key research component of management literature, where the interest has been fuelled by the relevance of the correlation between an organisation's strategy and external conditions in the strategy and organisational theories (Thompson, 1967). Two main studies provide a good overview of the Dynamic Capabilities Theory. Teece et al. (1997) define dynamic capabilities as a company's ability to "integrate, build and reconfigure internal and external competencies to address rapidly changing environments". Conversely, Eisenhardt and Martin (2000) state that dynamic capabilities are specific strategic processes. In general, the dynamic capabilities framework consists of strategic and operational processes (Güttel and Konlechner, 2009).

Extant literature reveals that the DCT has been used in many distinct conceptualisations. Teece et al. (1997) presented the DCT as a follow-up to the resource-based view (RBV) of the firm (Barney, 1986, 1991). As identified in the preceding section, the RBV provides a resource and capabilities-based explanation into the determinants for a firm achieving and sustaining competitive advantage. The RBV works on the premise that there is heterogeneity of resources and capabilities across the firm and that these resources and capabilities, if valuable, rare, difficult to imitate and non-substitutable can provide competitive advantage (Barney, 1991). However, the RBV is generally considered not robust enough to provide adequate explanation of a firms' competitive edge in dynamic environments (Priem and Butler, 2001). From this work, Teece et al. (2018) proposed the dynamic capabilities framework to address the research gap. The DCT is widely considered as a reaction to deficiencies associated with the Resource Based View in the new conditions

of an economy of knowledge and innovation (Mintzberg et al., 2003). Research on dynamic capabilities has been wide ranging and has focussed on factors including the concept, nature, and antecedents of dynamic capabilities, and their adoption in numerous fields.

A review of the existing literature shows that there is increasing awareness, over the years, about the impact of dynamic capabilities on business performance. In the extant literature, scholars like Eisenhardt and Martin, (2000); Porter, (1990) and Teece et al. (1997) find that dynamic capabilities have a positive relationship with organisational innovativeness and competitiveness. For instance, Teece et al. (1997) argue that dynamic capabilities provide an assessment of a firm's capability of achieving and sustaining competitive advantage in the current uncertain and complex business environment. Even though researchers affirm that dynamic capabilities contribute to firm performance, Helfat et al. (2007) cites the lack of strong empirical evidence to support this idea. Besides, Drnevich and Kriauciunas (2011) note that there are several limitations of identification of dynamic capabilities. Some of the challenges identified include not incorporating dynamic capabilities in the organisation's internal processes (Tallon, 2008). Additionally, it can be complex to utilise dynamic capabilities as this demands a large-scale management team which can be at times tedious (Drnevich and Kriauciunas, 2011).

The DCT has been widely adopted in management research. Newer studies include that by Lin and Wu (2014), who studied the relationship between dynamic capabilities and the RBV framework. In doing so, they investigated the link between different resources, capabilities and organisational performance. The study surveyed 1000 Taiwanese firms, finding that dynamic capabilities can improve performance by mediating the firm's Valuable, Rare, Inimitable and Non-Substitutable (VRIN) resources. Similarly, Cheema and Saeed (2015) utilised DCT to study organisational performance. The study investigated the impact of

dynamic capabilities on organisational performance and investigates how organisational competencies moderate any established relationship. The study was focussed on the paper industry in Lahore, Pakistan.

The DCT is still actively utilised in management research. Different applications of the theory in dynamic environments have been investigated. For instance, Ringov (2017) contrasts dissimilar claims on the link between dynamic capabilities and organisational performance in a range of dynamic environments. The study argues that internal organisational factors such as dynamism exposure and asset base complexity need to be accounted for and included in investigating the relationship between dynamic capabilities and organisational performance. The paper provides insights into the way the value of dynamic capabilities is influenced by both internal and external factors.

Importance of Resources and Capabilities in Organisational Innovation

There has been a build-up of literature that has adopted the RBV theory as a basis of viewing and studying firm innovation and innovation performance. In addition, there has also been a focus on studying innovation as a factor that drives growth. This can be done at both organisational and national levels, where it was observed that countries that adopt technological innovation grew faster than those countries that do not. It is on this basis that innovation research in recent times has been largely focussed on understanding the antecedents of innovation and how they can increase innovation performance.

The research model presented below draws from the RBV and DCT theories to identify the antecedent factors that drive innovation and how they ensure effective innovation management and performance. The following paragraphs will explain the core and components of these theories and how they are adopted to form variables in the conceptual

framework presented in this chapter. The key justification for utilising these two theories is that they have been widely studied and understood and also enable the analysis of innovation from both organisational-level and project-level, as they are linked to both physical and organisational space.

2.3.3. Components of the Research Framework

The model is identified as a conceptual process model – it is a multi-stage, sequential model that links the identified antecedents of innovation with the specific stages of innovation as it aims to help answer the specific research question. Figure 4 provides an illustration of the proposed research framework. The different components of the framework are discussed subsequently. The framework is made up of three key parts: (i) the antecedents of innovation, (ii) the stages of innovation, and (iii) the innovation performance.

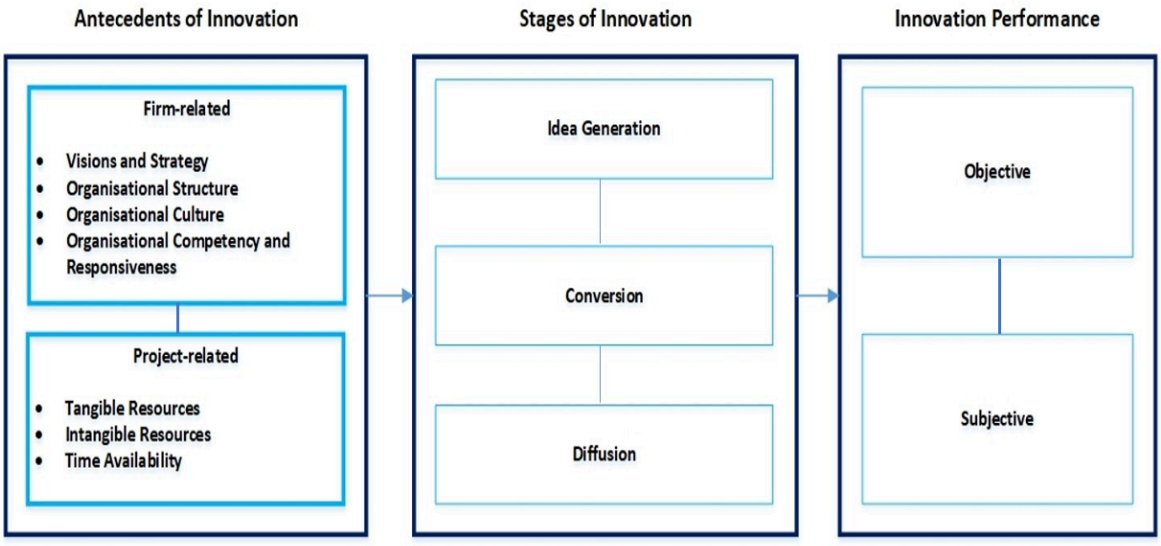


Figure 4: The proposed framework

(Source: Adapted from Herrera (2016, p.1727), Hansen and Birkenshaw (2007, p.123), Teece (2018, pp.363) and Panne et al. (2003, p.313))

Antecedents of innovation

Numerous studies have worked on identifying drivers and hindrance factors of innovation. As the literature review in Chapter 2 shows, many efforts have been made by researchers and practitioners to find the most appropriate strategies for implementing and attaining favourable innovation. In that regard, Tawiah and Russell (2008) propose that the identification and understanding of the determinants of successful implementation of innovation or technology is vital to achieving successful innovation.

As a result of the literature review in this study, it was gathered that studies on the antecedents of innovation could be classified under two broad categories, namely Organisational/Firm-related antecedents and Project antecedents. At the organisational level, a range of antecedents have an effect on the deployment and successful innovation deployment. In addition to that, a dedicated set of organisational competencies and skills is required to increase the chance of successful innovation (Martínez-Ros and Orfila-Sintes, 2009). The organisation needs this set of skills and competencies (knowledge sharing, human resources, vision and strategy etc.) in order to be able to innovate successfully. These competencies and skills have often been highlighted as the determinants of organisational innovation. As noted by Panne et al., (2003), there are varying opinions concerning the factors that determine innovative failure or success. Hence, it is a requirement for a more systematic evaluation of the factors that influence the success of innovation (which is part of what this conceptual framework will help investigate).

The Organisational antecedents investigated in this research framework are (i) Vision and Strategy; (ii) Organisational Structure; (iii) Organisational Culture; (iv) Organisational Competencies and responsiveness. The project factors investigated in this conceptual

framework are (a) time availability; (b) allocation of resources; (c) intangible resources such as leadership, top management, employees and cross-functional teams.

The justification for choosing those particular antecedents/factors is because they have been widely researched and are found to fall under categories that are based on firms taking a comprehensive and integrated approach towards determining the incidents and characteristics of innovation decisions, as well as considering what is necessary to fully understand individual characteristics of firms, employees, managers, teams, and groups and how they affect decision-making regarding innovation. This gives the researcher a comprehensive overview of both organisational and project-related antecedents. Both organisational and project factors (adopted as component variables of this conceptual framework) were derived from a range of publications, which generally discuss antecedents of innovation in context of individual determinants, organisational routines and activities, external influences, and factors related to knowledge transfer and networking. Greater details, including definitions, of the antecedents of innovation used in this conceptual framework is shown below.

Organisation/firm-related antecedents

This research framework includes the following organisational factors, which were all found to be key antecedents of adoption within the extant literature.

- **Vision and Strategy –** Numerous studies find that in order to successfully adopt and implement innovation, an organisation needs to have a clear direction in terms of its vision, mission, and strategy (Herrera, 2016; Panne et al., 2003; Dobni, 2008; Donate & Guadamillas, 2011). It would need to effectively assess how changes (as a result of proposed innovation) would impact the organisational innovation effectiveness.

This view is advocated by Donate and Guadamillas (2011) and Zhang and Duan (2012), who find that organisations with clear strategic perspectives tend to have more effective and successful innovations. In that regard, vision and strategy is considered a key component of this conceptual framework.

- **Organisational structure –** Chen and Chang (2012), Rizova (2006) and Daugherty et al., (2011) suggest that the structure of an organisation is a critical determinant of successful innovation. Organisational structure can influence the innovation process as it determines the channels and pace through which knowledge and ideas can spread, determines relationship patterns between employees and management and outlines structures through which organisational learning can be sustained (Rizova, 2006).
- **Organisational culture –** This relates to the collective values and principles of organisations and also their management structure. Drawing upon Herrera (2016), the roots of organisational culture lie in the value systems and beliefs that employees share in the organisation. In addition, the correlation between corporate culture and innovation has been investigated and several contributions have been made to extant literature (Buschgens et al., 2013; Hogan and Coote, 2014). Organisational culture impacts corporate strategies concerning innovation. This makes it an important component of this conceptual framework.

  A key component of organisational culture is Entrepreneurship. Entrepreneurship concerns the articulation of a firm's objectives and vision in order to achieve exponential growth and sustainability over small profit. This is often achieved by introducing innovative products and technologies to the firm. Numerous studies reflected on relationship between innovation and entrepreneurship. Ulijn and Brown

(2008) find that innovation is intertwined with entrepreneurship and it's often considered a primary activity of entrepreneurship. Similarly, Baum and Bird (2010) suggest that innovation targets are more likely to be achieved when entrepreneurial orientation is emphasised on. Drucker (1985) also affirms the importance of entrepreneurship in innovation efforts within numerous industrial settings.

- **Organisational competence and responsiveness –** Organisational competence is concerned with organisational knowledge, skills, values and attitudes. It focuses on improving organisational learning to improve and sustain knowledge at all levels of the organisation, for all employees. Organisational competence is a critical antecedent of innovation because it affects the internal processes of organisations, the business environment and the strategic fit of proposed innovation projects (Teece, 2018; Sirmon et al., 2007; Teece, 2014).

A critical aspect of organisational competence is its dynamism and responsiveness to changing market conditions by developing an effective response to those changes by reconfiguring resources to react accordingly. De Quinn (2000) finds that responsiveness is vital for ensuring the continuity of innovation.

Project-related antecedents

This research framework includes the following project factors, which have also been identified from extant literature.

- **Time availability** – Time availability has an impact on the creativity and innovation of employee groups and on the methods used on the daily thoughts, experiences and events within the organisation (Anderson et al., 2014). Some studies indicate that limited time availability spurred creativity and innovation (Baer and Oldham, 2006; Ohly and Fritz, 2010) whereas others found that putting employees under temporal

pressure only had limited positive effects to a certain threshold, after which it results to negative outcomes (Hsu and Fan, 2010).

- **Intangible resources –** Due to the increasing importance of intangible resources in producing competitive advantage and driving innovation, some researchers (Kogut and Zander, 1992; Nonaka, 1994; Decarolis and Deeds, 1999) presented a follow up on the RBV named the knowledge-based view (KBV). The KBV considers an organisation from a knowledge-based view with specific emphasis on an organisation's knowledge base, as a strategic resource and a critical driver of competitive advantage (Kostopoulus et al., 2002). This reasoning suggests that firms must not only look to create knowledge internally but also be open to ideas and knowledge from external sources in order to prevent rigidity, spur innovation and make technological advancement comparisons with their competitors (Leonard-Barton, 1995). In that regard, evidence suggests that there is a positive relationship between organisational knowledge and the capacity of that organisation to innovate.

Recent research emphasis has been on intangible resources. Strategically, intangible resources are vital to the development of sustainable advantage. They represent the assets that bring together requirements that make products or services valuable, unique and hard to imitate by competitors (Hitt et al., 2001). Intangible resources include human capital, advanced technical skills, technical know-how in R & D. Intangible factors as such are strong drivers for firms to carry out innovation activities (Tellis et al., 2009; Rosing et al., 2011; and Anderson et al., 2014). The intangible resources considered in the conceptual framework in this chapter are as follows:

a. **Leadership** – Leadership is vital to successful deployment of innovation. Leadership drives innovation in organisations by setting the baseline for the workforce to follow. This includes laying out effective strategies and strong execution, establishing trust in their employees, having a clearly defined and well-communicated vision for the future, challenging the status quo, and providing support and encouragement to employees (Mumford and Licuanan, 2004, Tellis et al., 2009, and Rosing et al., 2011). Studies of Herrera (2016) and Cotterman et al., (2009) buttress the importance of leadership in establishing a culture that supports innovation. Leadership can take many forms including transformative leadership (leaders who work towards the constant improvement of their teams and organisations), democratic leadership (including team members in the decision-making process), autocratic leadership (taking decisions without consulting team members) and laissez-faire leadership (giving team members a lot of freedom). Herrera (2016) finds that democratic and transformative leadership are the most effective schemes for achieving innovation as they involve the input of a diverse range of team members who would approach the project from differing points of views.

b. **Top management** – The senior management team approach in responding to requirements for resource allocation to both exploratory and exploitative efforts is important for a successful innovation (Jansen et al., 2008). Senior management team or decision-makers in the organisation have a unique and critical role in each step of an innovation project. They have a

key role in helping projects run efficiently and smoothly (Cotterman et al., 2009; Ford et al., 2010; Camelo-Ordaz et al., 2015).

c. **Cross-functional teams** – Cross-functional teams give rise to the development of new knowledge, in order to address challenges between functional units and fields, and to gain knowledge from downstream processes of innovation (Cotterman et al., 2009). Cross-functional teams involve a team of employees (both can be internal and external to the organisation) from differing backgrounds working towards a common goal or project. Numerous studies have identified the importance of including cross-departmental expertise and views in adopting innovation and providing an environment of committed employees across all organisational levels (Bruneel et al., 2012). Doing this is expected to develop teamworking and boost innovation performance within organisations (Basadur and Gelade, 2006).

- **Tangible resources** – The allocation of resources is a vital determinant of successful innovation. These resources can be financial, non-financial, manpower-related or infrastructural. The lack of adequate resource allocation has led to the failure of numerous innovation projects as there were no risk mitigation techniques put in place (Brook and Pagnanelli, 2014; Salerno et al., 2015). The categories of resources considered in the conceptual framework in this chapter are as follows:

  a. **Financial resources** – Extant literature shows that the availability of funds is paramount to the ability of a firm to expand its capacity to innovate. This has been found in numerous studies such as Lee et al. (2010); Brook and Pagnanelli (2014); and Salerno et al. (2015). On the other hand, extant

literature also shows that firms who lack adequate financial resources are limited in terms of their innovation (Camelo-Ordaz, et al., 2015). Financial resources are often required to support and conduct R & D activities and to invest in any operations required for firms to innovate.

Technical resources – These include IT-related, engineering-related and manufacturing-related equipment, facilities, and systems. Studies such as Goodale et al. (2011) and Drucker (2007) show that the availability and access to technical resources positively affects innovation and innovation performance. This is because innovation efforts require investment in terms of both funds and of technical equipment, which could either produce unique and diversified products for the firm or increase product quality for the customers.

Stages of innovation/innovation value chain

Hansen and Birkenshaw (2007) proposed the first idea of IVC after their 10-year work investigating large R & D projects. They proposed a model which presents an integrated process of converting new ideas into commercial outcomes. This process comprises three stages. These are Idea Generation, Idea Conversion and Idea Diffusion. Idea Generation concerns the development of ideas for innovation. Hansen and Birkenshaw (2007) posit that generating new ideas can be achieved internally, by collaborating either externally or between internal units. These processes are known as Cross Pollination, and External. The second stage is Idea Conversion, and concerns converting new ideas into innovations. Accordingly, Hansen and Birkenshaw (2007) state that firms need to carefully scrutinize these ideas in order to know which to advance, fund and support. This process is referred to as selection. The next stage concerns developing those generated ideas into products, processes or services. After this, the innovation is then disseminated within and outside the firm. This is referred to as diffusion. The IVC, as developed by Hansen and Birkenshaw

(2007) serves as the basis for the research framework used in this study to investigate innovation in the Qatar Foundation.

Innovation performance

As highlighted in many parts of this thesis, innovation is a complex and multivariate phenomenon. Innovation, which is regarded as an intangible source, leads to the diversification of theoretical framework and research methodology. The multidimensional design of innovation can result into methodological complexities (Manoochehri, 2010) and thus can make the selection of performance metrics complicated. Therefore, selecting the right methodological design can be difficult when examining innovation performance. This research framework will consider subjective and objective metrics, as discussed below.

The objective metrics utilise indicators rooted from the organisation as a result of its level of innovativeness. Objective metrics depend on real life data. This is crucial of this method as it provides different selection of metrics that can be applied to assess the level and nature of innovation within an organisation (Romijn and Albu, 2002; Chen and Muller, 2010; Crossan and Apaydin, 2010). For example, R & D expenditures and projects, new products and services introduced, patents filed and possessed are objectives measures that can be used to assess the performance of innovation. The most common objective metric used for measuring innovativeness is the number and value of newly introduced products. This measure is often considered in operational terms as profits derived from the sale of new products, sales value of new products, market value of new products, growth rate attributed to the sale of new products (Mankin, 2007; Mairesse and Mohnen, 2002 and Manoochehri, 2010). In addition, the objective approach has the advantage of utilising secondary sources of data. This frees up employee and organisational time that would otherwise be spent

empirically collecting data. However, there are some downsides associated with objective approaches. Secondary sources of data can be inadequate, and difficult to access and generalise (Maravelakis et al., 2006).

On the other hand, the subjective approach facilitates assessment of the innovation process as it is in progress. This means that the process is assessed by researchers before products or services are introduced (Alegre, 2009). This is beneficial in industries with long innovation cycles (Chen and Muller, 2010). The subjective approach utilises standard metrics which enable generalisation and comparison of results (Alegre, 2009). This is why it is recommended as a suitable method innovation research. However, the chances of errors in the results of subjective approach is higher than that of objective approach because respondents present their opinions (Maravelakis et al., 2006).

2.3.4. Implications of Theory on Model Components

The two theories shown earlier (the RBV and DCT) were both used to inform the various constituents of the model. To recall, the RBV focuses on the internal resources within the firm that offer it a means of innovating and having a competitive edge. The theory assumes that these internal resources are Valuable, Rare, Inimitable and Non-Substitutable (VRIN), thereby enabling the firm to achieve a sustained competitive advantage (Brink, 2019). VRIN resources can be divided into 3 categories: physical resources (such as physical technology, equipment, location and access to raw materials), human resources (such as training, managerial insights, experience, intelligence and relationships) and organisational resources (the organisational structure, planning mechanisms and other co-ordinating systems) (Brink, 2019). Despite having VRIN resources, the benefit to the firm may be limited by how they use the resources as the RBV makes no mention of how the firm exploits the VRIN resources is possesses. This is addressed by the DCT focuses on the ability of a

firm to integrate, build and reconfigure its competencies (both internal and external) in a rapidly changing environment. For this theory, the capabilities are the ways with which a firm can use its resources using routines or processes and skills to reach the desired result differently and more efficiently than its competitors.

The RBV can be used to explain the firm and project related antecedents of innovation proposed in the model. The “Vision and Strategy” is a Valuable, Rare, Inimitable and Non-Substitutable (VRIN) human resource that can offer the firm a competitive edge by giving a unique direction to shape the operating and management practices over its peers (Teece, 2018). However, it may be difficult to keep it inimitable as competitors can easily catch on and replicate the vision and strategy of a company if it proves to be successful. The “Organisational Culture” and “Structure” can also be considered VRIN resources that can be analysed using the RBV as they can both be unique resources to a firm that help streamline the internal structure and culture to give a competitive edge over its peers. Again, these can be replicated by competitors which highlights the limited competitive edge that they can give. The “Organisational Competency” and “Responsiveness” are the firm related antecedents that can offer the greatest competitive edge using the RBV as they are built on unique human resources (such as training, managerial insights, experience, intelligence and relationships) that are very difficult to replicate without directly contacting employees in the firm for knowledge (Teece, 2018). This can prove to be difficult for competitors when the firm has its competencies and responsiveness divided across a large number of employees.

The project-antecedents can also offer the firm a potential competitive edge according to the RBV. The “Availability of Time” can be a crucial internal resource for innovating firms as it gives staff members enough time to efficiently execute their tasks. Competitors playing catch up cannot benefit from this unique resource as they will be under time-pressure to

catch up to the successful firm. Similarly, the “Tangible” and “Intangible Resources” are very important VRIN resources that offer a competitive edge as they are the backbone of any project carried out by the firm – without them, the project cannot be executed. Having a unique access to these resources can keep a sustained competitive advantage that can be difficult for competitors to replicate.

The DCT focuses on how a firm can use its internal and external competencies to get a competitive advantage in a dynamically changing environment. For the proposed framework, the DCT would be applicable to the “Stages of Innovation” section as it shows how a firm can use and adapt its “Idea Generation, Conversion and Diffusion” to best exploit the unique antecedents it possesses, to create a sustained competitive edge over other firms. The firm and project related antecedents in the model can also be analysed using the DCT. For instance, adapting the “Vision and Strategy” in response to changing market conditions can direct the company towards the market gap and keep it ahead of its competitors. It is difficult for competitors to replicate this as it is a dynamic process. A similar argument can be made about the other firm antecedents, namely the “Organisational Culture, Structure, Competency and Responsiveness” as well as the project antecedents (“Time Availability, Tangible and Intangible Resources”) as they can all be changed dynamically with a changing market to help keep them unique to the firm (heterogenous) and give the competitive edge.

2.3.5. Link Between Model Components and Literature

This section summarises the various components of the model and their link with the relevant literature. The antecedents of innovation can either be firm or project related. The

first firm-related antecedent is the “Vision and Strategy” and is informed by Herrera (2016), Panne et al. (2003), Dobni (2008) and Donate & Guadamillas (2011). They all show that having a clear direction in terms of its vision, mission, and strategy is essential. A firm would need to effectively assess how changes (as a result of proposed innovation) would impact the organisational innovation effectiveness. The “Organisational Structure” is informed by Chen and Chang (2012), Rizova (2006) and Daugherty et al. (2011) who suggest that the structure of a firm is critical for successful innovation. The “Organisational Culture” is informed by Herrera (2016), Drucker (2007) Buschgens et al. (2013) and Hogan and Coote (2014) who all find that the collective values, principles and management structure of an organisation is vital towards achieving innovation. The “Organisational Competence and Responsiveness” is informed by Teece (2018), Sirmon et al. (2007) and Teece (2014) who all find that the organisational knowledge, skills, values and attitudes are all vital towards innovation and that they can be enhanced through learning and training.

From the project antecedents, the “Time Availability” is informed by Anderson et al. (2014), Baer and Oldham (2006), Ohly and Fritz (2010) and Hsu and Fan (2010) who all find that having strong time constraints can potentially hinder the ability for a firm to innovate. The “Intangible Resources” can be categorised as “Leadership” (setting the baseline for the workforce to follow as informed by Mumford and Licuanan (2004), Tellis et al. (2009), Rosing et al. (2011), Herrera (2016) and Cotterman et al. (2009)), “Top Management” (giving sufficient authority to senior management as informed by Jansen et al. (2008), Cotterman et al. (2009), Ford et al. (2010) and Camelo-Ordaz et al. (2015)) and “Cross Functional Teams” (the focus on teamwork across different departments as informed by Cotterman et al. (2009), Bruneel et al. (2012) and Basadur and Gelade (2006)). The “Tangible Resources” can be categorised as “Financial” (having enough funding to undertake the R & D as well as

other innovative projects as informed by Lee et al. (2001), Brook and Pagnanelli (2014), Salerno et al. (2015) and Camelo-Ordaz, et al. (2015)) and “Technical” (having sufficient IT and other technical resources to support innovation as informed by Goodale et al. (2007) and Drucker (2007)).

The “Stages of Innovation” is informed by Hansen and Birkenshaw (2007). They proposed a model which presents an integrated process of converting new ideas into commercial outcomes after a 10-year investigation of large R & D projects. The “Innovation Performance” is measured using “Objective” (indicators such as R & D expenditure, new products and services introduced, and the number of patents filed as informed by Romijn and Albu (2002), Chen and Muller (2010), Crossan and Apaydin (2010), Mankin (2007), Mairesse and Mohnen (2002), Manoochehri (2010) and Maravelakis et al., (2006)) or “Subjective” (a subjective assessment of the innovative products and services as informed by Alegre (2009), Chen and Muller (2010) and Maravelakis et al. (2006)). NPOs can use either objective measures, subjective measures or a combination of both to assess the performance of a project depending on the nature of the project and its underlying objectives.

This link with relevant literature has been summarised in Table 4

Table 4: Link between model components and literature

Model Component	***Literature***
Vision and Strategy	Herrera (2016), Panne et al. (2003), Dobni (2008) and Donate & Guadamillas (2011)
Organisational Structure	Chen and Chang (2012), Rizova (2006) and Daugherty et al. (2011)
Organisational Culture	Herrera (2016), Drucker (2007) Buschgens et al. (2013) and Hogan and Coote (2014)
Organisational Competence and Responsiveness	Teece (2018), Sirmon et al. (2007) and Teece (2014)
Time Availability	Anderson et al. (2014), Baer and Oldham (2006), Ohly and Fritz (2010) and Hsu and Fan (2010)
Intangible Resources - Leadership	Mumford and Licuanan (2004), Tellis et al. (2009), Rosing et al. (2011), Herrera (2016) and Cotterman et al. (2009)
Intangible Resources – Top Management	Jansen et al. (2008), Cotterman et al. (2009), Ford et al. (2010) and Camelo-Ordaz et al. (2015)
Intangible Resources – Cross Functional Teams	Cotterman et al. (2009), Bruneel et al. (2012) and Basadur and Gelade (2006)
Tangible Resources – Financial	Lee et al. (2001), Brook and Pagnanelli (2014), Salerno et al. (2015) and Camelo-Ordaz, et al. (2015)

Tangible Resources – Technical	Goodale et al. (2011) and Drucker (2007)
Stages of Innovation	Hansen and Birkenshaw (2007)
Innovation Performance – Objective Measures	Romijn and Albu (2002), Chen and Muller (2010), Crossan and Apaydin (2010), Mankin (2007), Mairesse and Mohnen (2002), Manoochehri (2010) and Maravelakis et al, (2006)
Innovation Performance – Subjective Measures	Alegre (2009), Chen and Muller (2010) and Maravelakis et al. (2006)

(Source: summarised by researcher based on references in the table)

Chapter 3: Research Methodology

Research methodology defines the selection, evaluation and use of specific approaches to develop a strategy, action plan, process and/or design in order to achieve a set of research objectives (Crotty, 1998). Research methodology involves the collection, analysis and interpretation of data (Creswell, 2011). In social sciences research, choosing the appropriate methodology is of paramount importance. This is because it provides the basis through which the research question and Objectives will be met (Adams et al., 2007).

Research in the field of NPO innovation has been predominantly done using qualitative studies to better understand its complex nature. This complexity arises from the fact that innovation with social objectives is not a well understood phenomenon. For instance, Rey-Garcia et al. (2019) use an in-depth case study using qualitative enquiry to better understand the prevalence of social innovation in a cross-sector partnership between an NPO and a conventional organisation. Their method relied on the use of in-depth interviews with field experts and key decision makers in both NPOs and conventional organisations to better understand the complex nature of social innovation. Similarly, Reficco et al. (2020) use an in-depth case study analysis to better understand the importance of NPO innovation towards overcoming their bottlenecks, namely lack of financial resources and the difficulty of growing at scale. Moreover, Jeong and Kearns (2015) use an in-depth interview process with 42 executives, board members and other employees from Korean NPOs to better understand the different strategies used to achieve social innovation.

As shown by Miles & Huberman (1994) and Miles et al. (2014), there is no unique template for a Research Methodology as they are each tailored to the study of interest. However, Miles et al. (2014) show many aspects of a well-designed research methodology that this

study aims to follow. Many of these are echoed by Aguinis and Solarino (2019), who present several factors that have to be included in a well-designed methodology that increase the transparency and replicability in qualitative research. Many of these views towards enhancing the quality of a Research Methodology have been shared by studies such as Bansal and Corley (2012), Cuervo-Cazurra et al. (2016), Edmondson and Mcmanus (2007), Ghauri (2004), Rynes and Gephart (2004) and Welch and Piekkari (2017). Therefore, the research design, measurement, data analysis and data disclosure are formed around these factors, each discussed individually in the subsequent subsections to show and justify the choices made for each category considering the research topic and research question.

3.1. Research Philosophy

O'Gorman and MacIntosh (2014) argue that the philosophical underpinning of the research shapes the structure of the research study. It is setting out the foundations for a research study and explaining to readers the basis for researchers' knowledge development claims. Perhaps the best way to answer this key question "Why is philosophy important to our research study?" is to borrow the Newby (2014) explanation about research philosophy. He argues that the philosophical approach states perspectives and principles. The philosophical paradigm is vital as it is reflective of the researcher's perceptions of global affairs. It can influence not just how the researcher has conducted the research project, but more importantly what is researched and how the evidence is interpreted. In other words, philosophical assumptions have an impact on the structure, methodology and strategy of the research.

Saunders et al. (2016) state that research philosophy is "*a system of beliefs and assumptions about the development of knowledge*" (p. 124). They mentioned broad thought

processes in research philosophy such as ontological and epistemological approaches, each of which is associated with different assumptions. Ontology and epistemology are subjects of much debate among philosophers. Ontology concerns reality and its nature whilst epistemology is related to knowledge, its nature and the relationship between the subject matter and the researcher. When developing research methodologies, social scientists draw upon the different ontological and epistemological assumptions. These assumptions enable the researcher to better understand the best ways and methods of investigating the research problem and frame his/her view of it (Easterby-Smith et al., 2015). Further, those philosophical assumptions underpin the researcher's selection of a suitable research strategy, appropriate methods and data collection processes of research and analysis procedures (Saunders et al., 2016). Scholars differ on the 'best' philosophy to adopt in business and management research (Tsoukas and Knudsen, 2003). Hence, when choosing a specific philosophical position and designing the research project, researchers need to know that philosophical disagreements are inherent in management research literature (Ghauri and Gronhaug, 2005; Saunders et al., 2016).

The nature of reality and how it is measured is defined by the terms, epistemology and ontology (Carson et al., 2001). The common epistemological approaches are positivism and interpretivism (Galliers, 1991). The next section looks at the philosophical traditions of positivism and interpretivism along with their applicability to the research. The following section highlights the philosophical stance of this study with a justification to which paradigm this research is inclined towards.

3.1.1. Positivism

The term positivism is acknowledged as a branch of philosophy that increased the popularity in research through the early nineteenth century as a result of the works of French

philosopher Auguste Comte (Richards, 2003). Positivism is an aspect that claims validity is only present based on humans. Likewise, positivism is not controlled through the senses, but it is considered to be overseen by the immutable laws within the research. As a result, the position of positivists is considered to be related to the position of realism which as a result motivates positivists to understand the social world as a natural world where there is a cause-effect link that exists between the phenomena, in turn once that relationship is formed, certainty is able to be guaranteed for the future. Therefore, it is acknowledgeable that positivists attain the same beliefs as in the social world (Rehman and Alharthi, 2016).

Positivism is based on deriving meanings from sensory methods and interpreting them using logical and/or scientific methodologies. It advocates a view that reality is stable, meaning it can be studied objectively with no interference (Levin, 1988). The approach adopted by most positivist researchers is organized and structured in processes initiated by defining a topic, formulating theories and hypotheses and adopting a suitable methodology to achieve their research outcomes. Furthermore, positivist researchers maintain neutrality towards the studied phenomena by differentiating between their feelings and reason (Carson et al., 2001).

Karl Popper, who was the 20th-century philosopher was the first to critique positivism (Fox, 2008). He challenged the assumptions of positivism and argued that the attempts to achieve research objectivity are inherently subjective. According to Popper, in order to analyse the social phenomenon more deeply, metaphysical questions should be included in scientific inquiry as there is no reliable means that guarantee scientific discoveries. The notion of ‘falsification’ presented by Popper states that evidence could be rejected if they are claimed false (Bisel and Adame, 2017). According to Popper, knowledge is hypothetical, conjectural, and provisional (Bisel and Adame, 2017). This implies that scientific theories cannot be

proved, however, these can be accepted for a temporary period and can be refuted by other unfalsified theories on a rational basis. In addition, Thomas Kuhn (1962) and Hacking (1983) criticised logical positivism in their work as well (Mendie and Ejesi, 2014). Furthermore, the positivist paradigm has correspondingly been clearly and widely critiqued by interpretivism and critical theorists (Gage, 2007). However, despite all the criticism, the positivism paradigm has various fields of view and maybe suitable within different research areas.

3.1.2. Interpretivism

Later, due to the social scientists' criticisms of positivism and their arguments of its inadequacy to fulfil their needs, the interpretivism view was introduced by Kant (1724-1804). Then, Dilthey (1833-1911), Rickert (1863-1936) and Weber (1864-1920) developed the interpretivism (Collis and Hussey, 2014: p. 44). Social research requires a focus on gaining an empathic understanding of an individual's feelings and perceptions and the meaning that they assign to everyday life with the goal to gaining an in-depth understanding of the individual's behaviour (Rao, 2018: p9). Interpretivism fulfils that by enabling the researcher to investigate meanings associated to the understanding of human behaviour, interactions and society. This involves researcher's attempt to develop an in-depth comprehensive subjective understanding of people's demography. Therefore, interpretivism philosophy is appropriate for social research (Rao, 2018: p. 9). In addition, drawing upon Saunders et al. (2012, p137), the interpretivism approach is suitable for studies in business and management especially in the fields of "organisational behaviour, human resource management and marketing". Therefore, this research also follows the interpretivism philosophical approach.

Unlike positivism, interpretivism ontological assumption is subjective and socially constructed. In other words, reality is subjective and varies from one person to another

(Guba and Lincoln, 1994, p. 110). Interpretivists believe that reality is subjective as opposed to positivists who believe that reality is objective (Collis and Hussey, 2014: p. 45). Willis (2007: p. 110) emphasises that the goal of interpretivism is to value subjectivity, and that interpretivists argue the possibility of applying "objective" research on human behaviour. According to Smith (1993 p. 5), researchers who adapt this philosophical paradigm do not accept the existence of universal standards for research; instead, the standards guiding research are "products of a particular group or culture". Interpretivists do not seek answers to their research problems in rigid ways. Instead, they approach the reality from subjective perspective, typically from people who own their experiences and are of a particular group or culture. Contrary from positivists who often accept only one correct answer, interpretivism is much more inclusive, because it accepts multiple standpoints of individuals from different groups.

As stated above, the researchers who adapt interpretive paradigm often seek answers to research question or problem by forming and underpinning multiple understandings of the individual's standpoints. Further, Creswell (2003) and Yanow and Schwartz-Shea (2011) claim that interpretivist researchers find reality through participant's perspectives and opinions, their own background and experiences. According to Willis (2007, p. 194), the idea of multiple perspectives arises from the belief that external reality is variable. Willis further emphasises that "*different people or groups have different perceptions of a particular context*". Thus, the acceptance of multiple perspectives in interpretivism often leads to a more comprehensive and in-depth understanding of the situation (Klein and Meyers, 1998; Morehouse, 2011). This will significantly facilitate researchers when they need 'in-depth' information from population rather than statistical sampling.

The major characteristics of the two philosophy paradigms are presented in Table 5 below.

Table 5: Positivist and Interpretivist Research Philosophies

Paradigm	Positivism	Interpretivism
Ontology	Views reality as governable by nature and as objective and singular	Views reality as governable by individuals and as subjective and multiple
Epistemology	The researcher does not interfere with the study	The researcher interferes with the study by participating in it
Methodology	Hypotheses are formulated pre-hand to guide research	Based on hermeneutical refinement of constructs rather than present hypothesis
	Deductive approach adopted	Inductive approach adopted

(Source: Guba (1990, p.13))

Based on the discussion made earlier, my ontological and epistemological stance is that reality is subjective, socially constructive and cannot be independent of her interest. I believe that reality is constructed by our perceptions and how the participants and I view the world. This stance is captured by interpretivism, which allows for the exploration of the complexity of the various phenomena, aiming to gain an interpretive understanding by adapting methods that will help in describing, translating and devising with meaningful terms. Therefore, reaching findings by analysing the data using qualitative methods that interpret qualitative data. I thus follow a qualitative case study approach to investigate, describe and interpret the participants' different experiences, behaviours and perspectives in the context of non-profit organisations, which in this study is the Qatar Foundation. Interpretivism enables me to focus on interpretations and understanding of the phenomena of innovation within non-profit organisations by focusing on meaning and subjectivity (Henriques et al., 1998). In addition, I use qualitative methods which focus on processes that are not evaluated

according to size or frequency, but rather interpretations and discovery. Hence, selecting participants from different operational positions and backgrounds, who are engaged directly with innovation projects within the organisation, and allowing them to freely express their different perspectives and experiences, will enable me to have a comprehensive understanding of the participants' different viewpoints and behaviours leading to an in-depth investigation of the phenomenon. Also, it will help look at, and understand the process followed within the organisation to manage innovation projects, and how those individuals who are involved with these projects perceive the process and what role they play. This will allow me to deeply understand, interpret and explore the hidden issues associated with the innovation projects and the process followed within the organisation and answer the research question.

3.2. Research Design

The design was formed using the criteria proposed by Aguinis and Solarino (2019 for a transparent and study. Their criteria stemmed from a comprehensive overview of reputable literature using the keywords, "quality," "transparency," and "trustworthiness"."

3.2.1. Nature of Research Design

There are 3 main classes of research design, namely exploratory, descriptive and causal research. By definition, exploratory research investigates new insights or studies a new phenomenon (Robson & McCartan, 2015). In other words, a study with an exploratory purpose is known for its novelty since it explores/defines new ideas and variables (Gray, 2019). In contrast, descriptive research is used with a well-structured research problem to describe a problem, situation or phenomenon that is well understood, typically using a cross-

section approach (Ghauri and Gronhaug, 2005). A causal research design studies the research problem by looking for a causal relationship (Robson & McCartan, 2015).

I use an exploratory research design as it a flexible method that allows for changes over the course of the study. This is well-suited for the interpretivist philosophy as it allows for a dynamic investigation of the phenomena being studied in a research problem that is not well understood, which in this case is the investigation of the key antecedents of innovation for large NPOs.

3.2.2. Inductive vs. Deductive Reasoning

Choosing the appropriate research approach is based on the pre-set research questions or hypotheses, the research gap being filled, and the target market for the study (Creswell, 2014). In addition, the use of theories in research projects and whether the researcher wants to test theory or develop a theory, have an impact on the decision related to the research design (Saunders et al., 2016). These two methods are very crucial approaches to research methodology. Both research approaches require a critical review of literature to be conducted, rather than just a description of what other scholars have said (Greener, 2008). After reviewing the literature, the applicable theoretical framework is made by the researcher either from existing theories or the generation of a new theory. According to Ghauri & Gronhaug, (2005), in deductive research the researcher uses existing knowledge to deduce hypotheses which can be tested empirically therefore be accepted or rejected. In other words, hypotheses of existing theories can be tested using the deductive method (Saunders et al., 2016). These hypotheses must include concepts that the researcher translates into entities that can be researched (Bryman, 2016). The deductive approach process starts with the theory and the hypotheses driven from it which drive the data collection and the rest of the process (Ghauri & Gronhaug 2005; Bryman, 2016). According to Ghauri and Gronhaug

(2005), this approach is considered to be more suitable for the quantitative research and therefore it can be argued that it is not relevant for this study which is based on the qualitative methods and does not aim to test theory.

The inductive approach is a data-driven approach which follows sequential stages to explore the topic by building theoretical lens used during data collection and analysis (O'Connor & Rice, 2001; Tracy, 2013). The inductive process starts with observation and findings and leads to theory development where the researcher integrates the findings into the literature to develop the theories (Ghauri & Gronhaug 2005; Bryman, 2016). Perhaps the greatest strength of this approach to theory development is its flexibility (Crowther & Lancaster, 2008).

For this research project an inductive approach is employed, as I am investigating theory in the form of a conceptual framework. I explore the innovation phenomenon and draw conclusions based on the data I collect related to the chosen cases.

3.2.3. Qualitative vs. Quantitative Study

The methodology of a study, in general, relies on the objectives and the underlying philosophical stance of a researcher (Žukauskas et al., 2018). Qualitative methodology can be defined as an approach that seeks to explore phenomena (Creswell et al., 2007). It helps a researcher to perform an in-depth or detailed analysis while relying on more flexible tools, thereby illustrating the compatibility between a qualitative methodology and an exploratory research purpose. A qualitative approach, by understanding experiences, situations, values, beliefs and other subjective constructs can help develop new theories and gain new insights, thus supporting exploratory research (Kalu & Bwalya, 2017).

In contrast, the quantitative research methodology is generally based on a positivist research philosophy, considering the objective of bridging a research gap and focusing on a single and objective reality that is independent of social actors (Saunders, 2012). The underlying philosophy enables this methodology to use highly structured methods and establish cause and effect relationships. In the context of research purpose, a quantitative approach better relates to explanatory purpose rather than exploratory purpose due to its ability to build on known variables and relationships. It seeks to confirm propositions/hypotheses and relies on highlight-structured methods, thus lacks flexibility. Therefore, it makes it difficult for the researcher to explore phenomena using quantitative methods.

Qualitative research focuses on investigating and developing an understanding of life lessons and experiences and behavioural processes. Previous studies in the field of NPO innovation have relied heavily on qualitative research. For instance, Rey-Garcia et al. (2019) relied on qualitative enquiry (a case-study approach using in-depth interviews) to investigate the prevalence of social innovation in cross-sector partnerships between NPOs and normal organisations. Similarly, Reficco et al. (2020) used qualitative techniques (an in-depth case-study analysis) to better understand the importance of innovation towards overcoming the various bottlenecks in NPOs. Moreover, Jeong and Kearns (2015) use the qualitative approach (an in-depth interview process) to investigate strategies used by Korean NPOs to innovate socially. I use qualitative methodology as it is largely based on non-numerical data. The data is to be gathered through in-depth interviews to explore the phenomenon and answer the research question. According to Tracy (2013), qualitative research intends to provide the understanding and explanation of a respondents' perspectives and narrations, enabling the researcher to provide insights on the subject matter being investigated.

Therefore, considering the nature of this study and the research question, the qualitative method is considered appropriate and helpful for achieving the research objectives, as it will enable me to address issues emerging in relation to the innovation context within the organisation on holistic, non-statistical bases (Ghauri and Gronhaug, 2005; Klen and Myers, 1998).

3.2.4. Case Study Approach

The first criterion can be explained as “defining the particular qualitative research methodology used in the study” (Aguinis and Solarino, 2019, p.1295). Miles et al. (2014, p. 27) show more than 20 different kinds of qualitative studies, including well established traditions such as ethnography, grounded theory, phenomenology, case study and content analysis and progressive kinds such as poetic inquiry, narrative inquiry, ethnodrama, autoethnography and duoethnography. This study follows the case study approach following Ghauri (2004).

According to Adams et. al. (2007), the case study approach is considered the most suitable for the analysis of organisations which makes it widely utilised in the business research arena. Meanwhile Yin (2003) states that a case study is an inquiry on a system over a period of time. He further defined it as an empirical investigation into a bounded system or case in their domain which signifies related phenomenon are not clearly apparent. Additionally, Cohen et al. (2013) state that case studies represent a vital source of relevant data for research due to the fact that they are based on real organisations with real people in real situations. This allows readers to connect with the research and its outcomes better than where only abstract theories and principles are presented.

O'Leary (2004) categorises the use of case studies in social science research into three categories. Firstly, case studies provide a holistic view of the research problem. Secondly, case studies are not high cost or resource intensive. Thirdly, case studies allow for an in-depth study and a critical analysis for a more valuable contribution to the research area. (Yin, 1989; O'Leary, 2004). An added feature of the case study is that it offers a multifaceted appreciation of social research phenomena. (Harper, 1992; Ragin and Becker, 1992; Lewis, 2004; Schaffer, 2000). After comparison with other methods, Ritchie et al., (2003) further concluded that case studies offer more flexibility than the other methods.

The case study utilises such methods as interviews, observation and critical analysis to achieve in-depth investigation into research phenomena (Hakim, 2000; Holloway and Wheeler, 1996; Robson et al., 2015; Yin, 1993, 1994; O'Leary 2004). Yin (2003) concluded that managing and processing findings and observations are important aspects of case study design and this provides for a more critical understanding of research problems (O'Leary, 2004, Denscombe, 2005).

Furthermore, the 'how' and 'why' questions of the research topic are studied deeply in real-time through in-depth observation / interviews and thorough analysis (Cohen et al., 2013). Meanwhile Ritchie and Lewis (2003) and Yin (2003) cautioned that the peculiar context of the selected case study needs to be carefully considered and this could be achieved by identifying the differences between participants across case studies. In this case study, the researcher compares six cases across their individual contexts.

In this research, the multiple case strategy was utilised as a qualitative method for data collection and analyses. The multiple case study approach has an advantage over the single case study because it allows the researcher to conduct comparison of more cases to identify

peculiar phenomena associated with the investigated research problem. The findings from case study approach are considered strong and reliable (Baxter and Jack, 2008). While the multiple case-study design approach enables me to substantiate the theories postulated with more convincing evidence based on real cases, Eisenhardt and Graebner (2007) add that the approach allows theories to evolve which would achieve a wider exploration of the research question.

3.2.5. Research Setting

The research setting is described as “the physical, social and cultural milieu of the study” used to clarify the structure, sources and strength of the pre-existing conditions and research setting (Aguinis and Solarino, 2019, p.1295). Following a case-study approach, this study is set around the Qatar Foundation, with a comprehensive overview of the nature of the firm, scope of operations, size, strategic objectives and relevance to its context already given in the Introduction of this thesis. The specific nature and relevance of the case studies used for the study are discussed in the next section.

3.3. Data Collection

3.3.1. Sampling Procedures

It is important to define the sampling procedures used to select the cases and the participants as it clarifies the kind of variability sought by the researcher along a specific set of dimensions (Aguinis and Solarino, 2019, p.1295). As shown by Miles et al. (2014), qualitative sampling tends to involve small samples of people / cases that are studied in depth relevant to the context of the study. This is in contrast to quantitative research, which aims for a large number of observations. Thus, qualitative sampling tends to be purposeful rather than random. Qualitative sampling is also theory driven, whereby the choice of

participants, episodes and interactions should be driven by the underlying conceptual question and not by a concern for representativeness (Miles et al., 2014). For this study, the sampling was driven by the overarching research question and the conceptual framework.

Purposeful sampling can be categorised into different forms, such as convenience sampling, heterogenous sampling, homogenous sampling, typical case sampling, extreme (deviant) case sampling and critical case sampling (Miles et al., 2014). This study searches for a variation in the perspectives of people belonging to the cases presented earlier as it enables one to view the phenomenon from all angles (Miles et al., 2014).

3.3.2. Selection of Cases

Silverman (2000) noted that identifying and selecting information-rich cases will allow the researcher to create relevant theories for the research. Kuzel (1992) and Bryman (2016) confirm that the selection of cases or sampling in qualitative studies are done based on criteria that allow the researcher to find answers in line with the research problems rather than at random. The number of selected cases is unique to each study. In some cases, one selected case is sufficient (Yin, 2003; Ghauri and Gronhaug, 2005) but the number of selected cases is determined by the parameters of the research, such as objectives and questions (Ghauri, 2004).

The two main designs of case study in qualitative research are: “multiple” and “single” case-study designs (Payne and Payne, 2004; Bryman, 2016). The single case study is preferred for the study of a unique phenomenon that has not been investigated previously (Saunders et al., 2016), while the multiple cases study is preferred to generate multiple results across selected cases of study. Thereafter, comparisons and assessments of the research variable and their peculiarities can be made (Ghauri and Firth, 2009). In this study, the phenomenon

of innovation in a big non-profit organisation that manages different types of innovation projects is being explored. The aim of the study is the investigation of the different key antecedents of innovation, the process of innovation and their impact on innovation projects performance during an innovation lifecycle from idea generation to commercialization or market introduction. Comparative case design allows for the comparison and assessment of different innovation projects to acquire in-depth information into their antecedents and their processes. In line with the objectives and research question, selection of cases was achieved based on the following criteria:

- The project has to be operated within and fully managed by the organisation, which is the Qatar Foundation (QF). The study investigates the key antecedents and the major processes of innovation and their influence on the innovation projects internally within the organisation to explore the issues that emerge in the process. Further, this will ensure that the projects share some similarities that make them comparable.
- The project has to fall under one of the types of innovation identified and studied in this research, which are: process, product, and management innovation. This will help the researcher to contrast the influence of antecedents and processes of innovation on the various types of innovation projects.
- The project that has to be started and ended to see the influence on the innovation project performance.

In essence, the decision on case study sampling is determined by the research problem. The research question presented are concerned with antecedents of innovation, process of innovation and innovation performance. The selected sample consist of six innovation projects of different types of innovation and different entities within the organisation. Those cases were selected based on the types of innovation that are investigated in this study

which are: process, product and management innovation. Product innovation projects that have been investigated are in the field of computing science; process innovation projects are from the operation department and transportation department which are both under the facility management entity; the management innovation cases are selected from the research and development (R&D) division under the policy, planning and evaluation department. The following table shows the selected cases.

Table 6: Selected cases for the study

Selected Cases		
Innovation Type	**Cases**	**QF Department**
Product	AIDR	QCIR
	Jalees	
Process	CAFM	Facilities Management
	VTS	
Management	PMS	Policy, Planning and Evaluation Department of R&D
	NIS	

(Source: the researcher)

Unit of Analysis

In a case study, the selection of the unit of analysis is important for two main reasons. Firstly, definition of the appropriate case study helps to further define the boundaries and limitations of the study (Payne and Payne, 2004). Secondly, there is evidence to show that an appropriate case study selection is paramount to adequate data mining, which aids in

making relevant and powerful interpretations about the study (O'Leary, 2004). Somekh and Lewin (2005) made an epistemological argument that designing the boundaries of the study is an essential issue to be addressed hence they enable the researcher to draw the depths and limits of the study.

As indicated earlier, a researcher might refer to the unit of analysis as a case, which in this case can either be a single case study or multiple (Payne and Payne, 2004). Therefore, the projects are the unit of analysis, which reflect multiple cases design. QF is non-profit organisation, with a mandate to look after its citizens by initiating, supporting and executing various beneficial projects. The Foundation is active in numerous industrial settings and manages different types of innovation. There are three key mission areas where the foundation has programmes: education, community development and research and development. These are the basis upon which cases are selected for analysis and comparison.

3.3.3. Interviews

The study makes use of semi-structured interviews for data collection. The interviews with the participants for each case study were conducted sequentially after each other, followed by a data analysis on the findings for the respective case study. Taking this approach rather than conducting the interviews for all of the case studies at one time before analysis enables me to reflect on the challenges faced during previous interviews and make remedial changes for the future interviews (Miles et al. 2014). Semi structured interviews are recognised as one of the common interview forms used across variety of field, as it offers a structured, yet open, approach towards understanding complex phenomenon. Respondents are offered similar questions with various wordings to allow for a range of responses (Gall et al., 1999). The nature of the questions provides respondents with the freedom to express their

responses in vivid details and the researcher to request for more information. This type of interview is widely utilised in contemporary research as it consists of open-ended questions that allow maximum expression of perceptions, opinions and perspectives from respondents. While the approach provides researchers with detailed and rich data, the process of sorting and analysing the narrated responses is often tedious especially when an effective coding process is utilised for effective representation and accuracy. However, Gall et al. (1999) noted that this approach minimizes the tendencies of bias from the researcher especially where there's a reasonably high number of respondents. The researcher has a list of questions prepared for the participant where the interviewee has an opportunity to raise the issues promptly with the researcher which can lead to the key insights that were not anticipated (Braun and Clarke, 2013). It will also give researcher an opportunity to ask further questions and probe the interviewee related to the raised issues. This will facilitate researcher to get an in depth understanding in relation to the research phenomena.

Selection of Participants

The determination of the sample size in qualitative research is considered to be debatable and a controversial topic amongst methodologists and researchers in the literature (Ghauri and Gronhaug, 2005; Brayman, 2012; Creswell 2013). Morse (2000) argued that the sample size of a qualitative study usually depends on the data quality, study nature and scope, significance of each interview outcome, and the study design. However, Miles et al., (2014) explain that when the new insight from data stops emerging, it can be regarded as a sign of data saturation. The diversity of samples can also facilitate in data saturation, which is why in this study the participants holding different positions are selected for interviews which can help to get rich data rather than interviewing participants holding same positions. In each case study, I targeted 3-5 individuals who represent roles from management, research or

operational staff (engineers and ordinary employees) and directly involved with innovation projects within the organisation. The number of individuals per case study aligns with QF's strategy in assigning number of individuals to a project, which often ranges from three to five individuals. Therefore, it is expected that the count of participants is likely to be up to 25 participants in the study that were employed by the Qatar Foundation for the six different projects in the three different sectors.

Preparation for the Interview

A clear focus is of utmost importance to develop the interviews to benefit the research study and in order to achieve this, McNamara (2009) recommends assigning time and resources for the preparation stage. Chenail (2009) further emphasised this by suggesting ways to enhance research instrumentality and minimise biases through some exercises prior to interview. McNamara (2009) suggested the following guidelines for the preparation stage of an interview process: (1) choose a serene environment with minimal interruptions; (2) communicate the objectives of the interview; (3) discuss the confidentiality terms and conditions of confidentiality; (4) communicate the interview phases; (5) discuss the duration of the interview process; (6) provide contact details for post-interview discussions; (7) discuss any other issues they may have before the interview commences; and (8) record each responses in a safe place. In line with the guidelines recommended by McNamara (2009), adequate preparations will be made in order to ensure that accurate and reliable responses are obtained and recorded.

Interview design consists of constructing effective questions for the respondents to answer in the interview phase of the research. Among the suggestions made by McNamara (2009) for constructing critical questions related to this study's problem are as follows: (a) questions

should have open-ended wordings (it allows respondents freedom to answer questions uniquely); (b) questions should be constructed without bias (it allows respondents to provide original answers without concern or prejudice); (c) questions should be posed serially or sequentially (d) questions should have maximum clarity and be unambiguous (which involves knowing peculiarities of the environment and the respondents' conditions); and (e) sensitivity to respondents where "why" questions. In this research, the guidelines suggested by McNamara (2009) were implemented in the construction of the interview questions to achieve careful wordings that address the main objectives of the research and acquire unbiased responses.

Implementing the interview is a vital part of the interview process that must be completed successfully. To achieve that, McNamara (2009) highlighted the following steps: (a) routinely check to ensure the recording device is still functional (if in use); (b) questions should be asked one at a time; (c) avoid leading the respondents (bias due to emotions and leading expressions, etc.); (d) read respondents body language; (e) provide effective intermissions between topics; and (f) maintain focus throughout the interview process (as respondents can stray into other topics which could elongate the process). In this study, the suggestions of McNamara (2009) were implemented to enable respondents' freedom and comfort to express their answers in accordance with the research aims and objectives earlier presented in the first chapter of the research work. Please to refer to APPENDIX-D for the interview questions.

Documenting the interviews

This study utilised the recording of interviews and note-taking method. All interviews were recorded and at average took 2 hours. The participation in the interview was completely

voluntary and participants were allowed to withdraw at any point in the study. The participants were given an information sheet before obtaining their consent that explained the data collection and storage procedure. The data is stored with anonymous participant identification in the University of Birmingham secure archives. The information sheet with participant consent can be found in Appendix C.

3.3.4. Pilot Study

In this study, the pilot study took place within the AIDR case study. A pilot study is an important preparatory phase. It enables the researcher to identify errors, restrictions and limitations of the chosen data collection approach or strategy and subsequently correct them and make effective modifications (Kvale, 2007). The pilot study would allow the researcher to acquire feedback that would be used to make the necessary refinement.

3.4. Data Analysis

3.4.1. Data Analysis Overview

I inter-weaved data collection and analysis which helped facilitate a dynamic investigation of the research problem over the course of the study. Additionally, overlapping data collection and analysis improved the process of data collection as it helps refine subsequent interviews and ensured that emerging themes were explored further (Ghauri and Gronhaug, 2005). The data coding and analysis procedure described by Miles & Huberman (1994) was used this study as described in the following subsections involving *data coding and first order codes* and *data analysis using second and higher-order codes*.

3.4.2. Data Coding and First-Order Codes

The raw data from the interviews were initially categorised using first order coding schemes, which can be defined as “labels that assign symbolic meaning to the descriptive or inferential information compiled during a study” Miles et al. (2014, p.80). The process of coding began by reading all of the interview transcripts to familiarise myself with the data, due to the diverse range of cases that were studied using interviews of varying duration. This was followed by a process of carefully re-reading the transcripts line by line to extract the key codes (labels) that helped reduce the raw data using the coding mechanism described by Miles & Huberman (1994), in which labels (either a word – often a noun – or short phrase) were used that summarised the main idea of the piece of data. For this study the codes included *Vision, Mission, Strategy, Structure, Culture, Entrepreneurship, Competence, Knowledge, Responsiveness, Availability of Time, Leadership, Management, Cross-Functional Teams, Financial Resources, Technical Resources, Idea Generation, Idea Conversion, Idea Diffusion, R & D Expenditure, Number of New Products and Projects Introduced, Patents Filed* and the *Social Impact.*

This coding method was adopted as it offered a comprehensive means of identifying the salient points in a piece of data using the conceptual framework as a basis. This helped guide the second-order coding, the forming of themes, the analysis of data and the display of data to ultimately answer the research question as discussed in the next section.

3.4.3. Data Analysis and Second – And Higher-Order Codes

This study used the approaches described by Miles & Huberman (1994) and Miles et al. (2014) for the higher order data analysis. This began with second-order coding using *Categories or Themes,* in which explanatory or inferential codes were used to group the first

order codes into similar categories or themes. This process helped arrange the codes in a meaningful order using the pre-existing concepts (from the conceptual framework) related to the overarching research question. This helped to gather and collate the codes into clusters or patterns that could be developed into themes based on the variables of the theoretical model. Additionally, second-order coding helped condense large amounts of data into a smaller number of analytic units and laid the foundation for cross-case analysis by revealing the common themes.

For this study, this process led to the grouping of Vision, Mission, Strategy, Structure, Culture, Entrepreneurship, Competence and Knowledge Responsiveness into *Firm-Related Antecedents*, and the Availability of Time, Leadership, Management, Cross-Functional Teams, Financial Resources and Technical Resources into *Project-Related Antecedents.* These were further grouped into *Antecedents of Innovation,* which represent the elements that pre-exist within the organisation that are used to facilitate the operation and completion of a project. Similarly, the Idea Generation, Idea Conversion and Idea Diffusion were grouped as *Stages of Innovation,* which represent the stages that innovation projects go through. Moreover, the R & D Expenditure, Number of New Products and Projects Introduced and Patents Filed were grouped as *Objective Measures,* while the Social Impact was grouped as *Subjective Measures.* These measures were then grouped as *Innovation Performance,* which represent the final outcome of the innovation project.

The systematic analysis of this grouped material was accomplished using Thematic Analysis (TA), which can be defined as a means of identifying patterned meaning across a qualitative dataset (Creswell & Poth, 2016). To achieve this, a thematic network was developed using the conceptual framework that comprised of themes at 3 different hierarchies: global, organising and basic themes. This was done to help unearth any emergent themes at the

different levels using the systematic analysis of data. The global theme represents the super-ordinate theme that can encompass the data as a whole, which in this study is *innovation in non-profit organisations*. The organising themes can be seen as the middle order themes that organise basic themes into different clusters, which in this case are the *antecedents of innovation*, *stages of innovation* and *innovation performance*. The basic themes represent the most basic themes derived from the textual data, which will be explored in the next chapter. It is important to note that some of the basic level themes (e.g., firm-related, project-related or idea generation) can also be seen as sub-organising themes, which means that they can include a number of themes and sub-themes. This thematic network guiding the data analysis for this study is shown in Figure 5

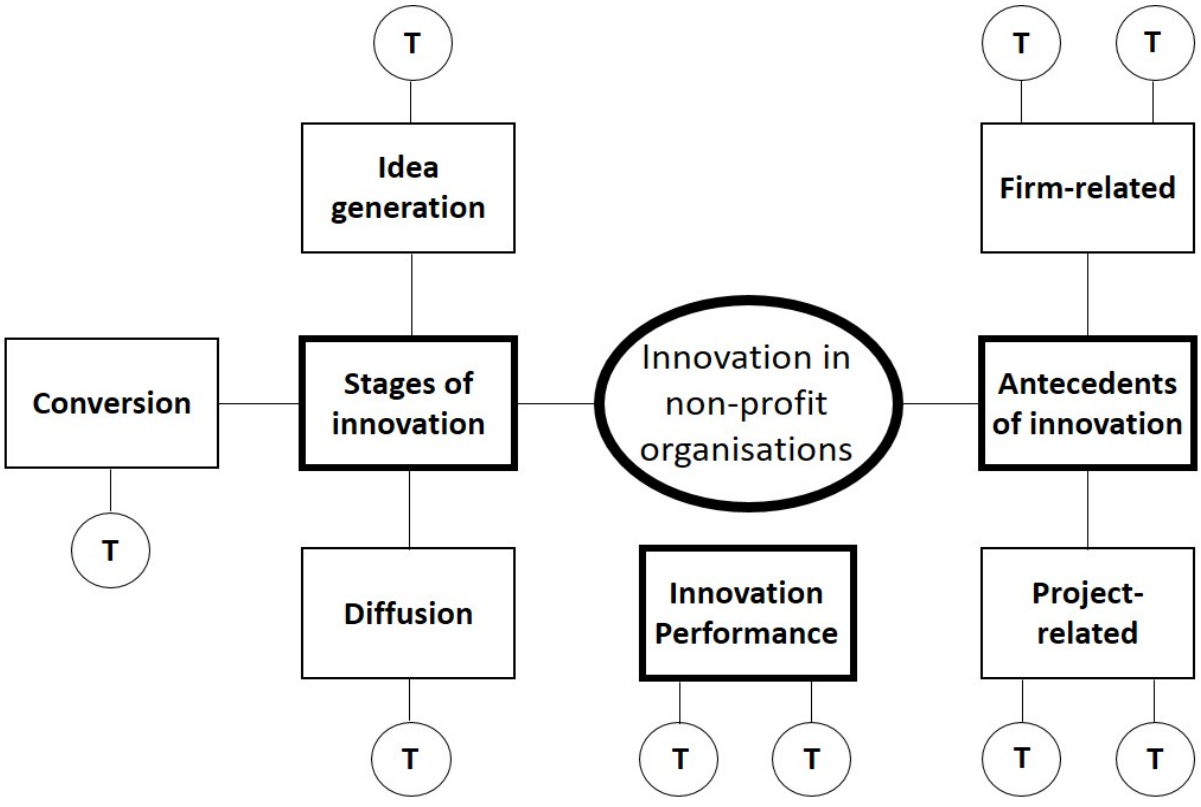


Figure 5: Thematic Network for this research

(Source: the researcher)

This ‘thematic network’ approach of TA as proposed by Attride-Stirling (2001) was chosen due to its flexible nature with respect to the research question. Moreover, a key strength of this method for the case-study approach taken by this study is its ability to structure, facilitate and depict themes that can unearth a research phenomenon to ultimately answer the research question Attride-Stirling (2001).

3.5. Ethical Considerations

3.5.1. Determination of Rigour, Relevance and Veracity

A challenge with obtaining qualitative data using interviews is the possibility of participant dishonesty when giving their responses. This study enhanced the transparency of participant responses using the techniques discussed by Miles et al. (2014, p. 262) that discuss looking for ulterior motives and deception:

- *Checking against "hard facts."* This was done by asking for supporting documentation such as business plans, proposals and other reports during the interview to support the claims made by the participant. Owing to confidentiality, the participants did not allow me to obtain a permanent record of this documentation; they were instead only verified by me during the interview before proceeding.
- *Checking against alternative accounts.* This was done by comparing the content of the responses from people within the same department to search for any inconsistencies and incoherencies that would point to any causes of concern. I also asked questions based on the responses of other participants from the same department during the interviews and looked for inconsistencies or elements of surprise.

- *Share your own personal story to open up to the respondent.* This was done by conducting the interviews with an inviting tone to overcome any social barriers between me and the participant. Moreover, I shared stories and anecdotes where appropriate to increasing the chances of the participant opening up.
- *Share what you genuinely think is going on and see how the respondent reacts.* This was done without immediately jumping to accusations by sharing any concerns with the participant and asking them to back their claims using proof or supporting documentation

3.5.2. Ethics in the Study

For this study, the researcher first went through the ethical approval process. The researcher followed the University of Birmingham ethical approval process by submitting all the needed information such as research question, research methodology and interview questions. The ethics approval was granted by the committee following amendments requested were completed by the researcher to their satisfaction.

This study ensured that the participants attained their confidentiality and were informed of this aspect. Furthermore, in order to ensure that anonymity and confidentiality were upheld throughout the study, all participant names were altered to number and symbols within the files that were used. The research also ensured that any hard copies were kept in a safe to which access was only granted to the researcher. In addition, the researcher archived the digital data in password-protected files on the University of Birmingham servers that are protected using the Data Protection Regulation (DPR) to further enhance the level of security.

The participants' involvement with this study was considered to be voluntary (Bryman, 2016; Creswell and Poth, 2016), but they were given the right to withdraw without giving a reason and at any time as long as the researcher was informed of the decision (Bryman, 2016; Creswell and Poth, 2016). The participants were given a consent form that they had to sign prior to the interview. This ensured that they fully acknowledged the study and all of their rights along with their impact on the research. The participants were also given the chance to ask questions to the researcher about any potential concerns. The consent form also contained the relevant information for participation, including emphasising that participation was voluntary and could be withdrawn at any time during the study (Bryman, 2016; Creswell and Poth, 2016; Zhong et al., 2019). In addition to the consent form, participants were provided with a comprehensive information sheet that clearly outlined all of the significant aspects of the study, which meant that their consent would have been fully ethical and informed.

3.6. Research Flow Diagram

The methodology of the study can be summarised using the research flow diagram shown in Figure 6

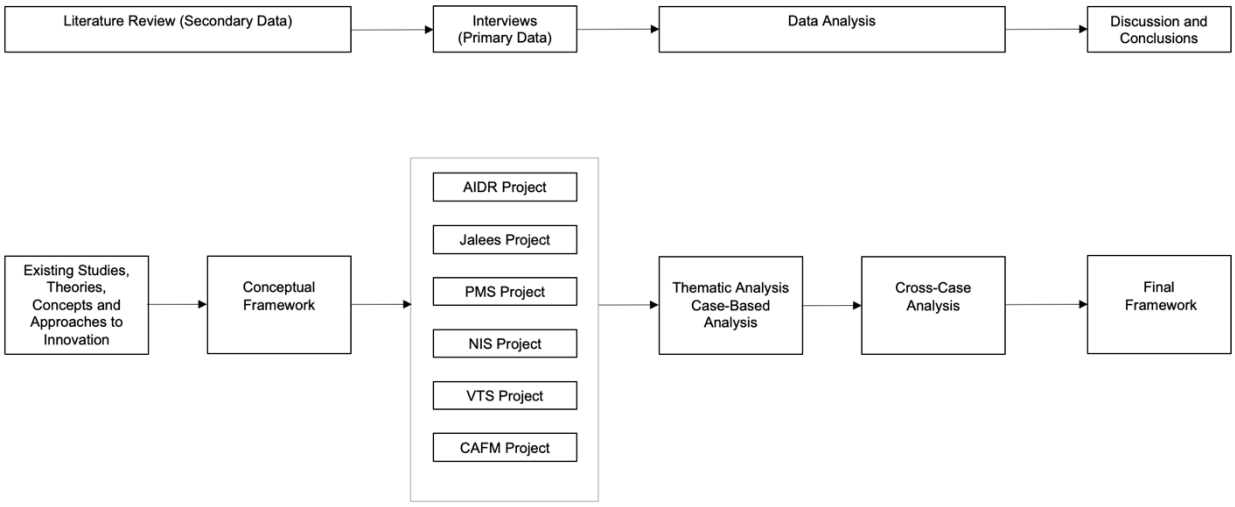


Figure 6: Research Flow Diagram

(Source: the researcher)

Chapter 4: Results and Analysis

4.1. Introduction

This chapter presents the findings and analysis of the primary data collected from six project case studies on the innovation activities within the Qatar Foundation (QF) that were elicited from the interviews with 22 participants.

According to Silverman (2000), the selection of the right cases supports the researcher in the generalisations and development of theory appropriately. These cases should provide rich and in-depth information about the important issues about the phenomenon. The case studies were sorted into three innovations of two projects each for *product*, *process*, and *management innovations*. In addition, the chapter presents other key considerations made in selecting the cases as discussed in Chapter 3 such as the project's success or failure across the three QF departments. This chapter utilises the case studies to investigate the antecedents of innovation, the different stages of the innovation process, the innovation performance and the interrelationships between those aspects within the QF.

4.2. Summary of Fieldwork

The summary of all of the interviews conducted for this study is provided in Table 7

Table 7: Summary of all interviews conducted

Number of interviews per case	Case	Date of Interview	Interview Location	Participant Role	Who conducted Interview?	Length of Interview
3	AIDR	27/5/2018	The participant's office at QCRI	Team Leader	The Researcher	1:35:28
	AIDR	31/5/2018	The participant's office at QCRI	Scientist	The Researcher	2:20:22
	AIDR	10/6/2018	The participant's office at QCRI	Senior Manager	The Researcher	58:55
3	Jalees	10/7/2018	The participant's office at QCRI	Engineer	The Researcher	1:00:02
	Jalees	15/7/2018	The participant's office at QCRI	Research Assistant	The Researcher	1:15:20
	Jalees	9/7/2018	The participant's office at QCRI	Senior Manager	The Researcher	2:00:04
3	PMS	9/8/2018	The participant's office at PPE	Operational Staff	The Researcher	59:32
	PMS	9/8/2018	The participant's office at PPE	Middle Manager	The Researcher	1:44:08
	PMS	12/8/2018	The participant's office at PPE	Senior Manager	The Researcher	59:07
3	NIS	14/8/2018	The participant's office at PPE	Operational Staff	The Researcher	1:52:34
	NIS	19/8/2018	The participant's office at PPE	Operational Staff	The Researcher	1:14:84
	NIS	10/9/2018	The participant's office at PPE	Senior Manager	The Researcher	1:33:55
5	CAFM	15/10/2018	The participant's office at FM	Engineer	The Researcher	1:21:42

	CAFM	17/10/2018	The participant's office at FM	Engineer	The Researcher	1:58:46
	CAFM	16/10/2018	The participant's office at FM	Middle Manager	The Researcher	1:05:51
	CAFM	23/10/2018	The participant's office at FM	Business Analyst	The Researcher	1:45:21
	CAFM	30/10/2018	The participant's office at FM	Senior Manager	The Researcher	1:36:26
4	VTS	24/9/2018	The participant's office at FM	Team Leader	The Researcher	59::32
	VTS	24/9/2018	The participant's office at FM	Middle Manager	The Researcher	1:08:18
	VTS	30/9/2018	The participant's office at FM	Middle Manager	The Researcher	1:14:05
	VTS	26/9/2018	The participant's office at FM	Senior Manager	The Researcher	59:46

(Source: the researcher)

4.3. Pilot Study

As part of understanding the research phenomenon investigated, a pilot study was conducted to gain further insight into the aspects investigated and whether further details were needed for the primary data collection. It has been argued that a pilot study is required before empirical fieldwork commences in order to minimise the issues and risks researchers have the probability of facing while collecting data (Bryman, 2016). The pilot study on the AIDR project revealed various outcomes and paved the path towards the other case studies. Firstly, it reviewed that the data collection method was effective for the study method meaning it was suitable to utilise on a larger scale. Furthermore, the pilot study was also effective in the evaluation of the study protocol as it was successful in obtaining effective outcomes. Likewise, the study also successfully attempted the process of participant

recruitment, which was suitable as the recruited participant aligned with the study criteria. Similarly, the interview process was also tested and. in turn, it was successful, meaning the efficiency was able to become maximised within the process. Furthermore, the researcher also acted in the interviewer as the scribe, meaning that this pilot study was useful for practice. Finally, the last benefit from the study was to test out the ability to generate themes and sub-themes, which was successful.

4.4. Qatar Foundation Departments

The Qatar Foundation (QF) is a non-profit organisation, which includes over 50 departments/entities that work in education, research and community development. The six projects investigated within this research belong to three departments: QCRI, PPE and FM. The QCRI (Qatar Computing Research Institute) mainly focuses on tackling large-scale computing challenges that address national priorities for growth and development. Similarly, QCRI is considered to have more research in areas such as Arabic language, technologies, social computing, data analytics, and cybersecurity. The PPE (policy, planning and evaluation) department occupies a crucial role as it sets out the base for all of the research departments in QF. The FM (Facilities Management) department manages facilities under strong leadership, which may need improvement that increases employee efficiency.

4.5. Analysis Structure

This study has developed a framework (Chapter 2), which illustrates the innovation process, and includes firm-related and project-related antecedents, stages for innovation and impact of innovation. The primary data collection was rationalised by the framework developed, which targeted the areas indicated above. Due to the nature of this study, and to understand the complex phenomenon investigated, multi-level analysis that comprises case-based

analysis will be presented in this chapter, and cross-case analysis will be presented in the next chapter.

The case-based analysis uses thematic analysis (as indicated in the methodology chapter) where the themes are as follows:

- Firm-related antecedents
- Project-related antecedents
- Stages of innovation
- Innovation performance.

The above themes are based on the framework developed, as this can support capturing aspects more holistically, and point out differences when conducting cross-case analysis. It is important to indicate that the themes and sub-themes are derived from the responses to the questions.

4.6. Qatar Computing Research Institute (QCRI) Case Studies

AIDR Case Study

The Artificial Intelligence for Disaster Response (AIDR) platform aims to facilitate the immediate information needed by the humanitarian organisations that are useful in times of disasters and emergencies. The rationale of the AIDR platform is to enable predictive analytics on the data generated by social media users and increase the response time of humanitarian organisations by mediating the decision-making process of providing aid to the affected areas. This used to be a prolonged process, involving multiple stages from being informed about the disaster and its intensity to determining the need for aid across affected sites. The project acquired a partnership with the United Nations and United Nations Office

for the Coordination of Humanitarian Affairs (OCHA), which strengthened its credibility. On request, AIDR has served the emergency management department during marathon events. As a result, this innovative idea acquired extensive recognition for its analytics potential indicating that the innovation project was a success for QF. However, it is important to determine which key internal antecedents and critical management aspects of innovation eventually contributed to the success of this attempt. Accordingly, the researcher interviewed two scientists and a senior manager at QCRI as the key personnel involved in the project. The following section is specific to the key insights captured from the responses of the participants, focusing on the objectives of the study.

Jalees Case Study

The Jalees Reader supports eBook files from PDF to ePub, ePub2 and ePub3, including interactive content and embedded audio and video files. Characteristics include a clean, straightforward design, an intuitive library, offering Carousel and Tile modes, right-to-left and left-to-right user interfaces for reading, and a morphological search function for Arabic. The product aimed to serve the need for Arabic support at Amazon by means of an eReader. However, QCRI did not consider seeking the association of Amazon, and instead developed a personalised prototype of eReader, Boraq. Boraq was compatible with iOS only, and its prototype was significantly valued by Bloomsbury Qatar Foundation Publishing (BQFP). Following the approval of this concept, the idea was taken to the project level.

The reader's compatibility needed to be modified for the Windows platform, and this was at the time when QCRI's employees were involved in the project. Furthermore, the team comprised two developers and two software engineers. The modified eReader was named 'Jalees' and it was offered to the Supreme Education Council. Hence, the drive for eReader

from Boraq to Jalees could not proceed further, as it failed to attain commercialisation that would brand it at the product level. Though the application received a significant response on the App store and also on its Facebook page, it could never approach entrepreneurship due to lack of interest or support from the funding source of QCRI, for instance, Qatar Science and Technology Park (QSTP). It is noteworthy that QCRI had put their maximum effort in terms of investments and other internal and external supports. However, despite this, the innovative idea of Jalees did not succeed as a start-up due to the QF policy that did not allow a research institute to run a start-up and also to the fact that QSTP did not agree upon the likely potential of QCRI to develop Jalees as a start-up. Interviews took place with a Jalees Engineer (**E**, in text below), a Research Assistant **(RA)**, and the Senior Manager (**RD**) as summarised in Table 8

Table 8: Participants' roles for both AIDR and Jalees Projects

Projects	Participants Role
AIDR	Team Leader (TL)
	Scientist (S)
	Senior Manager (SM)
Jalees	Engineer (E)
	Research Assistant (RA)
	Senior Manager (SM)

(Source: the researcher)

4.6.1. Firm-related antecedents

Organisational vision and strategy

According to the respondents, it was realised that QCRI forms its own vision and strategy, but ultimately aligns with QF's vision and strategy. It was also highlighted that, despite nature of the department, QCRI maintains a flat structure, which allow and motivate employees to come up with ideas that aim toward value creation whether at a local or international level. In the case of the AIDR and Jalees projects, both were bottom-up suggestions based on team members within the department, hence they had to be checked against QF's vision and strategy. According to one of the participants "*I would say a lot of here is bottom up … On the other side, I would say there is an increasingly growing top-down approach because it's important also in alignment with QF or the national strategy*" (SM, Jalees).

Therefore, it can be stated that although vision and strategy in QCRI is not directly cascaded from QF vision and strategy, projects proposed within the department need to align to QF vision and strategy so that these projects can go forward.

Collaboration and Culture

Based in the responses received in this study, it can be claimed that all employees at QCRI work in the same level in a collaborative environment. Generally, within QCRI, the culture can be perceived from a research and corporate perspectives. From a research perspective, there is a flexible working mechanism where researchers propose ideas and do what works to execute projects. From a corporate perspective, it takes a more formal approach where appropriate procedures need to be followed. This collaboration and cross-disciplinary improved the organisational structure and enabled the innovation projects. Similar to AIDR,

the culture of collaboration is embedded between groups within QCRI, and in many cases, many projects have knowledge crossovers, which can benefit different groups as the main enablers for collaboration. According to the respondents, the culture within QCRI reflects QF's culture where innovation and entrepreneurship are favoured. QCRI's staff are divided into groups to support maintaining and managing that culture. According to one of the participants, "*we have our mechanisms of setting objective evaluations and so on. So, this is where now the culture or the shift in the culture need to be reinforced. So, when I sit down with one of the team members and he set the objective for the next year this is where I can apply a soft push and say ok but we need something else here"* (Jalees, SM). For instance, some research projects do not fulfil their initial objectives, or do not clear alignment with the institute's objectives, and this is where the academic culture need improving. This strong embedded culture allows for better collaboration that starts locally then moves externally. Reflecting on this, it was also stated that the success of AIDR is highly influenced by QCRI's culture and this is impacted by individuals who are motivated to support QCRI in science and technology.

The above responses show that the culture within QCRI, in addition to reflecting QF's culture of innovation and entrepreneurship, has its unique identity. This is due to several factors including structure and individuals' motivation for science and technology. It was also highlighted that, to maintain the culture within QCRI, which impacted QF's culture, policies are being proposed.

Resources and competencies

Within QCRI, skill sets and experience, can be recognised as the main resource that support projects proposed. For instance, in the case of AIDR, the project success was impacted by

highly skilled individuals. In other words, resources, for example, manpower, can impact the success of the project. According to one of the participants, *"We have been very picky in who joins QCRI… so we want to bring this diversity to our single frame of mind, but also we look for people with a very rich academia and industry expertise"* (AIDR, SM). The initiative of Jalees was as result of the team members' knowledge and competency in their field as they managed to rationalise a project with impact at a country and global level. As a department, QCRI also takes diversity into account when recruiting resources. However, resources' availability is impacted by resources allocated within the department, and acquiring additional resources is considerably complex due to policies in place.

The above shows that human resource is seen as one of the main factors that impact success of the project whereas the availability of such resource is highly influenced by QF policies, which are seen as a challenge, and had an impact of AIDR and Jalees.

Governance and Policies

Within QCRI, governance and policies were seen as one of the major impacts on resources generally. So even if the resources are available, they may not be able to use them due to the policies in place. According to the participants, it was stated that the underlying policies that allow projects proceed from research to start-up projects are considerably lengthy and complex. In the case of Jalees, for instance, it was considered complex to move the project from QCRI to QSTP in order to advance it as a start-up project, and this was mainly due to the restriction of policies that do not provide flexibility in advancing projects where it was stated *"You should not stop at this stage if it's a policy or something that you are able to fix, change or update anytime, you should update if it serves the goals"* (Jalees, RA).

It is recognised that governance and policies impose major challenges when human resources are required for a project. From another perspective, the policies that allow projects to proceed from research to start-up are also complex and lengthy where this has impacted the transition of Jalees project.

4.6.2. Project-related antecedents

Project Resources

It was highlighted by participants that financial resources rely on a project's budget or funding given where AIDR and Jalees relied on the available resources within QCRI. In QCRI, human resources need to meet criteria and perhaps be allocated to the right projects "*Some of the people are quite resourceful in the sense they are able to reallocate resources or spend more time from their own to get it done specially when you have so many projects happening, you have to start prioritising*" (AIDR, SM). It was also indicated that human resources are over shared between projects, and this has impacted AIDR. According to respondents, AIDR was seen as one of the biggest projects in QCRI, as it required large efforts in terms of coding, hence it required major efforts by the team, which impacted their social and mental health. To elaborate on this, one of the participants stated ***"****I don't know what the policies and the strategies do they have there in QF, but it's affecting very badly the progress of the projects because a project that can be finished let's say in 2 years will need 3 years because there is no expertise. We want software engineering we can't force scientists to work as software engineers they are scientists"* (Jalees, RA). Moreover, one of the challenges faced by both AIDR and Jalees was lack of particular expertise, which was in software engineering *"We don't have the salespeople who knock on door and have the advertisement mechanism. Our mandate goes to prototype where we can show something that our technology actually has an interesting potential … but what are the mechanisms*

that would turn our Technology into a service or product there is something that goes beyond our Institute" (Jalees, SM).

The above responses showed that projects, generally, depend on funding allocated or budget provided where AIDR has relied on the available resources within QCRI. Another financial complexity, and impacted by nature of the project, was acquiring datasets to be used in the development of the project. For projects, the allocation of human resources is impacted by the project's priority and meeting the requirement criteria. The time limitation and oversharing of human resources on different projects had limited the time allocation of such resources which impacted the team in term of overworking at AIDR. In the case of Jalees, and in line what was mentioned before, human resources are seen as the main obstacle, and this can impact achievement of objectives. From a different angle, budget availability had impacted the advancing the product to be commercialised.

Innovation within the project: General factors

According to participants, motivation was seen as the main factor that impacts innovation, in addition to team working, and appreciation from top management. In fact, it was stated *"to me the 1st factor is the team motivation, if the team wants to do that thing … 2nd is hardworking, the team must be hardworking because during development there could be some unseen problems so the development doesn't always goes as planned … 3rd is appreciation from top management is always kind of a need by team members"* (AIDR, TL). It was also added that having an Ecosystem (balance between work and life) is seen as one of the areas of improvements that can boost innovation and creativity. On the other hand, one of the obstacles faced that hindered innovation is the policies that impose complex routes to follow to execute a particular task. For instance, in some cases, services had to be procured which took long time, and had to be done within the given budget. Multi-tasking

can be seen as another factor that can reduce the motive to innovate in a project, which is mainly as a result of shortage in human resources.

Based on the above responses, it can be stated that factors which influenced innovation are motivation, team working and appreciation from top management. However, it was also stated that not having an 'Ecosystem' (here taken to mean a balance between work and life) can hinder innovation and creativity. For Jalees, multi-tasking was the main factor that reduced motive to innovate, and this was mainly due to shortage in human resources.

Innovation within the project: Management and leadership

The role of management within a project can be in terms of leadership as this has a direct impact on innovation. One of the participants highlighted that *"if the management doesn't support what you are doing, then you can't work on it. Because management decides how much resource and support you are going to get … you want to create the highest impact by reaching out to big players. And I think in that case the management can play a big role … They are the face of QCRI in term of seeing the stakeholders and help to establish these connections"* (AIDR, S). Management is involved in decision-making and can change in terms of its rationale from a project to another. For instance, in AIDR, the project had to engage and reach out to different stakeholders, hence proper management was in need to ensure that the appropriate capabilities are in place. Similarly, for Jalees, it was indicated that management supports raising the right questions, which then needs communication to the top management. Leadership was also seen as an embedded element in every project and can influence the direction of a project.

Innovation within the project: Employees and teams

Workflows are seen as one of the essential steps that drive the process in any project, and usually they are based on achieving milestones. It was indicated that digital communication was a key especially within AIDR, as the team kept growing and the projects scope got bigger. In some cases, the clarity of defining the 'role' has resulted in some issues, and this has perhaps impacted the innovative part within projects. In the case of Jalees, the project was mainly driven by team members who wanted to support its initiative, and this has played a crucial role in supporting the project. This was perhaps highlighted "for example, Jalees, the team came and said this is a good idea can we do this as project, so this is more of bottom up. So, the ownership and excitement about the project could be in the entire team who said this is our project and we want it to be successful" (Jalees, SM).

Based on the above responses, it can be stated that workflows, setting milestones and digital communication were the main employee-related elements that supported innovation. For Jalees, the project was mainly driven by team members, but having a clarity over the role was the main team-related challenge.

Innovation within the project: Cross-collaborations

Cross-disciplined teams is seen as one of the areas for improving innovation within departments. In the case of AIDR, cross-disciplinary teams were not seen as one of the essential factors due to the nature of the project. AIDR's from one of the perspectives, is seen as a cross-disciplinary project as it involves multi-stakeholders including United Nations and also work with the Qatar Red Cross and Qatar Red Crescent, UNESCO, the UNICEF and others. In the case of Jalees, and similar to AIDR, cross-collaboration with other departments was not seen essential due to the nature of the project "*I haven't gone*

for a cross functional team. I don't think that this would bring any effectiveness, not in Jalees particularly. Maybe it would help with other project but not with Jalees" (Jalees, E). Collaboration's impact for Jalees included the involvement of Ministry of Education in order to have better value exposure and ensure that the product would have a wider outreach.

The above responses showed that, for both AIDR and Jalees, cross-disciplinary teams were not seen as essential factors. However, AIDR was considered a cross-disciplinary project that involved multi stakeholders including United Nations and also work with the Qatar Red Cross and Qatar Red Crescent, UNESCO, the UNICEF and others. In the case of Jalees, collaboration with Ministry of Education was seen important to have better-value exposure.

4.6.3. Stages of innovation

Idea generation: project scope

Due to nature of the department, and as mentioned before, projects' ideas (e.g. AIDR and Jalees) flow from bottom-top, are they have to align with the organisational strategy. It was highlighted that there is a degree of freedom given to the teams to ideas. For AIDR project, one of the participants indicated "*The project that we take has to align with the organisation strategy in term of the innovation, right people to be included and impact. There is a good freedom for the people working on the project, at least for the team leader to come up with new ideas. Given that freedom the ultimate core goal should not be changed*" (AIDR, TL). In fact, one of the team members outlined a number of stages that are followed when initiating a project include: proof of concept, and taking the concept to a project level and finally the product level "*The first is as I said is prove of concept … The second stage is to take this prove of concept to a project level so more on the simulation. Third stage is the*

product level. Once some good simulation and deployment of that project has been done then there is the product level with is commercialisation, which is the ultimate goal" (AIDR, TL).

Similarly, Jalees was also initiated by employees, but also had to align with QF organisational vision and strategy *"The project that we take has to align with the organisation strategy in terms of the innovation, right people to be included and impact. There is a good freedom for the people working on the project, at least for the team leader to come up with new ideas. Given that freedom the ultimate core goal should not be changed"* (Jalees, E). Within QCRI, self-motivation by employees is seen the main factor that drives innovative ideas but sometimes ideas with great potentials may not proceed, as the senior management cannot see the long-term sustaining of the idea and how it would survive in the market.

Based on the above responses, and for AIDR, it was mentioned that ideas are often proposed by teams and team leaders but had to align with the organisational strategy. As for Jalees, and similar to AIDR, it was stated that projects are gauged against their social impact, and the fact that they should aim for a wider audience and mapping projects not only against QF's vision but also at a national level.

Conversion: culture and working mechanisms

It is important to indicate that, within QCRI department, working mechanisms are not restricted, but had to comply with any potential legal obligation (e.g. copyright or contractual issues, and in many cases the research director provides a good level of guidance. Reflecting on Jalees project, "*There is a lot of flexibility and freedom … If we want to do something and there is a copyright on this and that, he wants us to do it because of the*

copyright. His suggestions like any other suggestion not like because I'm the manager you have to listen to me; it's not this way" (Jalees, RA). For projects, meetings dictate the follow up and progress of the project, and they often maintain a formal set up, as the outputs needs to be communicated back to the senior management. In fact, it was indicated that "*In the formal meeting we ask each team member to present the status of the milestones sat last week and what to do next week … Also the management receive updates about the progress of the project*" (AIDR, TL). Openness and transparency are seen as important factors within the team and help to maintain a healthy culture within the project's team. Furthermore, social interaction is also seen as an effective environment to motivate different employees to share their experiences and ideas, and perhaps create a friendly culture.

From the above responses, it is recognised that mechanisms that execute the projects are not restricted and can be changed. In the case of Jalees, mechanisms employed had to satisfy the targeted audience. It was also stated that openness and transparency, as well as social interaction are seen as primary elements that impact the culture within the institute. Generally, for projects, knowledge is shared through networking hubs in order to share good practices, and this has benefited AIDR. In the case of Jalees, meetings were the main medium for communication. Moreover, owing to the nature of Jalees, the team attempted to look for an existing tool as a starting point.

Diffusion

For AIDR project, the diffusion was successful, as the project had well-defined audience with a clear purpose and impact. On the other hand, in the case of Jalees, it was also added that the project lacked appropriate marketing and to deploy the project on a wider level within the community. This was perhaps reasoned by one of the participants who stated *"they said*

yes we like it, but we can give you 1 million dollar to start up a company we need an entrepreneur and the person you are suggesting is not entrepreneurial enough and this idea is not mature enough … The project didn't fail because of QCRI I have to admit, QCRI has given it enough support" (Jalees, RA). Often networks outside QF are employee-dependent, which mostly consist of other universities or research institutes, but do not necessarily get involved in projects, but can take an advisory with necessarily having this formalise, which was also the case for Jalees.

The above responses reflect that Jalees' deployment into the market was a major issue, and this is due to the top management's not pursuing an appropriate entrepreneur. As a project, external parties such as universities have advised about Jalees, and this was essential before implementation. At a product level, the constant change of specifications has impacted the implementation, and at the time of deployment, it lacked the appropriate marketing.

4.6.4. Innovation Performance

Impact, value and evaluation

According to one of the responses, AIDR has demonstrated its capability to support decision-making and investigate social impact within humanity organisations. For AIDR project, the publications produced and the multitude of their impact in the research world is seen as one of the main illustrations of project's success. AIDR has also received a number of awards that demonstrated its impact *"When we talk about AIDR we talk about how many deployments it had around the world, specific achievements that happened and awards that it received, it received so many awards right now from worldwide, and this is how we look at it as a success."* (AIDR, SM). Generally, for projects in QCRI, progress tracking and project

check-up are used to gauge the level of success within a project such as AIDR, and this happens every six months and annually. It was also added that every project gets evaluated against a set of KPIs, and they reflect the project's success. Although commercial outreach was seen as one of the main factors that demonstrate the success of AIDR, this was not achieved due to the focus on the humanitarian aspect of AIDR and seen as a work in progress. However, in the case of Jalees, although it was indicated that Jalees did not progress commercially, it was initially launched at the App Store, and communicated to the Education Council who expressed their interest in it *"We launched it on the app store and it's still there. And we reached out to the education council to see what is happening and their response was that ok we might considered it again can we get it for free…"* (Jalees, SM). However, like any other IT product, advancement was required to occupy a place within the market, but that was not the case due to lack of finances. Jalees was proposed to have an international market, which came as a result of not advancing within the local market, and the proposed market was Kenya. However, the team who proposed commercialising the product did not have marketing expertise, hence the product could not be merchandised outside Qatar.

The above shows that AIDR had an impact in terms of decision-making for social impact within humanity organisations and its capability to help affected people and organisations during disasters. Furthermore, the partnership within humanity organisations such as United Nations was also seen as one of the main successes within the project. Finally, the project won a number of awards, and its multitude was illustrated through a number of publications.

4.6.5. Summary and conclusion

The analysis of Jalees and AIDR showed that innovation is perhaps a thread running through projects that are bottom to top, but there are a number of interventions that impacted this.

At a firm level, and due to nature of the department, policies and procedures set by the department allow more collaborative culture where ideas can be exchanged, shared and even developed by employees/teams. Another important aspect to spot is the fact that the department maintains a flat structure, which reduces hierarchies that in many cases can impose political complexities. However, having these ideas approved by higher management is perhaps one of the recognisable challenges, as they need to illustrate alignment to QF vision and strategy, and clarity over budgeting and resources. At a project level, resources occupy a major role that impact bottom-top projects, whether at a financial or human levels, which was the case for both AIDR and Jalees. For AIDR and Jalees, the management's involvement took more of a progress report, illustration of alignment with the budget, but very low on impact innovation when compared to the team's/employees' impact that carried out most decisions. In AIDR, having a clear vision of beneficiary stakeholders resulted in success of the project whereas In Jalees, its impact could not be illustrated without commercialising it as a product.

It can be recognised that, reflecting on AIDR and Jalees, projects in QCRI take a product form, which needs to illustrate impact once initiated. One of the major impacting elements on projects is resources' availability, which depends on budgets allocated, and how human resources can be shared across different projects. Success of a projects within QCRI highly depends on early definition of the scope, and engaging the appropriate stakeholders, which

can be reflected in AIDR. This shows that project initiation remains as one of the most critical stages for projects within QCRI when compared with conversion and diffusion.

4.7. Policy Planning and Evaluation (PPE) case studies

PMS case study

The idea behind Performance Management System (PMS) is to plan, manage, and monitor processes that exist in the QF R&D department. Nevertheless, QF conveyed an interest in deploying this management innovation throughout the organisation. Due to a large organisation in terms of multiple entities, QF's management could be enhanced if all the bodies were reported and monitored on a shared platform throughout the organisation. For this reason, the idea was approved.

A 'Corporater' software of a Norwegian Company was selected as the best-fit solution from its record in yielding excellent outcomes in big companies, for instance, Qatar Steel. However, despite the efficacy of the chosen solution, a pilot study was conducted to determine if it would serve the QF objectives properly. Subsequently, the department of R&D was selected for testing the adopted PMS. The results of the pilot study confirmed the organisational-wide implementation of the management innovation, and PMS was then deployed successfully. Key personnel involved in this management innovation were interviewed, including the senior management, middle manager (being the part of the team of PMS), and senior evaluation specialist from the operational staff.

NIS case study

NIS (National Information System) is a management innovation initiated by the Policy Planning and Evaluation office of QF R&D in 2014. NIS is a department aimed at serving as a central repository, where all the relevant information in relation to the R&D in Qatar can be accessed. It was planned to serve decision-makers and policymakers who operate at a national level, as the current scenario of R&D ecosystem can be transparent in terms of the running or finished projects. It would also serve as a research source for the researchers, through the means of providing access to the relevant data across the field. As a result, this allows for a collaboration which can be achieved at a greater level.

The procurement scenario was initiated in 2015 when a Systems Applications and Products (SAP) provider was selected to be a vendor for dealing with technicalities of database management. Accordingly, the subsequent aspects of the design establishment were also planned. However, towards the end of 2015, the idea was not sustainable due to budget constraints, and the high price demanded by SAP. After this time there were certain structural changes within QF as a whole, and then NIS was reconsidered with certain modifications in turn it was, renamed as a Knowledge Information System. The idea again went through the phase of vendor selection and finalising. However, the contract with the vendor could not be signed as the organisation again experienced some structural changes, which eventually put the idea on hold a second time. At the time of this research, the idea is still active despite suffering from the impact of structural changes. Interview participants include the senior manager for QF Research, development and innovation IT, and two operational staff representatives from R&D IT and Policy Planning and Evaluation together with PPE function, respectively. The summary of participant roles is given in Table 9

Table 9: Participants' roles for both PMS and NIS projects

Projects	Participants Role
PMS	Operational Staff (OS)
	Middle Manager (MM)
	Senior Manager (SM)
NIS	Operational Staff 1 (OS)
	Operational Staff 2 (OS)
	Senior Manager (SM)

(Source: the researcher)

4.7.1. Firm-related antecedents

Organisational vision and strategy

The nature of Policy Planning and Evaluation (PPE) Department is different than majority of the departments within QF, as it takes a more managerial and corporate role, acting as the managing department for all the research institutes such as QSTP and QCRI. It was highlighted that the department's structure is top-down and follows QF in terms of its vision and strategy "*we are part of QF we are not working separately so as I said that Qatar Foundation has its mission, vision and strategy that it has set and which we supposed to follow in our own function. So we have to support QF's strategy*" (NIS, SM). Within PPE department, the projects are ultimately influenced by QF's vision and strategy, and mainly underlined by three pillars: research and development, community development and education. In PPE, uniquely, the initiation of projects can be a bottom to top and top-down within the department, and this depends on the nature of the project.

To summarise, the top-down organisational structure within PPE is driven by QF higher management, and this is due to nature of the department. At a project level, within PPE, it can take a bottom up or top-down approach, but ultimately depends on nature of the project. In cases where projects are top-down, a set of requirements is often defined to set compliance and procedures that need to be followed.

Collaboration and Culture

The nature of the department does not impose a level of hierarchy, which requires a long channel of communication, but instead, it is flexible and this provides a more collaborative culture within the department. In fact, it was stated "*Within the R&D is that we don't have this hierarchy concept of you can do this if you don't go through x y z. There is a lot of flexibility especially if you explain what you are going to do and you have the ok of your direct manager the highest management*" (PMS, OS). PPE operates collaboratively, and although the structure is top-down, working mechanisms as well as suggestions are often bottom up, so ideas are always welcome. Indeed, the management indicated that having a centralised R&D department has supported better management, coordination, and setting priorities, hence this structure is seen effective and efficient. In fact, one of the participants stated "*We rely on what we call 'the complete employee'; we are not specialised in one area, but by training or by choice when we select the staff we make sure that they could do variety of things at the same time*" (NIS, SM). Within R&D, the culture is open in character, and it is about sharing and helping one another. In addition, there is an attention paid to the characteristic of an individual when joining the team, so they need to fit and work together as a team. According to one of the participants "*I think the way you manage would influence the culture and the environment of the entity or the department. I don't think that there is a clear common culture across the whole organisation although the organisation is trying to*

foster a culture of innovation but the fact that it is huge organisation makes it had to happen" (NIS, OS IT).

From the above, it is realised that the despite the top-down structure, the department maintains collaborative culture with flexible working mechanisms, and does not impose long communication channels. In fact, the nature of the department in being a centralised R&D department has actually supported better management, coordination and setting priorities. Within PPE, and with the major influence of QF's on driving strategy of the department, the culture maintains flexibility, openness, and transparency as well as creating supportive environment. More importantly, it was also highlighted that the characteristic of an individual and how they operate within a team are essential.

Resources and competencies

In terms of resourcing, the department operates and adjusts requirements based on budget allowance. Similar to QCRI department, resources are crucial but acquiring them is seen as a long process. For instance, in the NIS project, objectives were adjusted according to the budget given, so that the final project can be delivered. In fact, with the limited budget, the original project was scaled down and the decision was to partnership with a company to execute the project, but this could not go forward because of an unexpected change of organisational structure.

It can be stated that competencies within the department differ, hence individuals are expected to adapt and learn to gain skills and be on the required level. In addition, the team is considered active in terms of educating themselves about new skills or improve an existing skill. In fact, the management indicated that the department recognised that responsiveness and adapting to different unexpected changes support improving level of competencies over

time. At a project level, and according to one of the respondents, it was indicated that the PMS project is considered a success where this was due to the level of competency of the team members through initiating the framework of the project, effective coordination, early establishing of KPIs and implementing the project.

From the above, it is realised that project requirements can be changed or adjusted based on resources' availability, which was the case for NIS project. This consequently has imposed the team to propose efficient mechanisms that can execute the project within the budget. Although the project could not progress due to restructuring, the project maintained its value and is due to commence when the new structure is in effect. Within the department, competencies differ, but individuals are expected to adapt and educate themselves. For the PMS project, it was considered as a success due to the level of competency of the team members who were able to deliver and implement the project.

Governance and policies

The majority of respondents indicated that the policies within QF are seen as rigid and restrict many of the processes within different departments, and this has influenced many operations within projects. For instance, the collection of data is mostly restricted because of the vagueness of the policies in place. In fact, one of the major complexities as result of policies is the process of recruiting staff on a particular project. For instance, it was stated that "*Being part of such a big organisation as QF; getting the staff even as temporary is not easy even though recently there is a new policy of having temporary staff*" (PMS, OS). This shows that acquiring resources is seen as a long process, and this is particularly due to restrictions imposed by QF, which influences human resources and procurement process. For instance, one of the respondents indicated that the complexity of policies within QF in

terms of acquiring services had caused delays and this was the case in the project where it got delayed because of material request.

The above participants' comments illustrate that policies within the QF are seen as rigid and inflexible, which mainly impact processes and resource acquiring within different departments. The participants indicated that resource acquiring impose most challenges as it takes time, and the process is complex.

4.7.2. Project-related antecedents

Project Resources

According to participants, within PPE department, the anticipation is always to keep the costs within the budget, some projects tend to underspend, and hence QF began to cut budgets given to projects every year. Elaborating on this, one of the participants indicated that "*The higher management of QF I think decided that every year there is going to be a cut on the budget based on their actual spending of previous years*" (PMS, OS). Thus, before commencing any project, a timeline is outlined to indicate different milestones and the key dates to meet them. Although this may be considered as a strategic approach from QF, the department recognise that this can impact their own strategy in terms of allocating the saved costs to other projects. For instance, PMS project, financial resources for the project were sufficient, and supported completion of the project. In addition, the budget cut did not have an impact because nature of the project did not require major finances. From another perspective, for the NIS project, all the resources were available, but some services were needed to be outsourced, and the complexity was acquiring it, as it was from another country. However, the inflexibility of having freelancers in Qatar forced the need to acquire the service internationally, which is not seen ideal in many cases.

The above shows that, the primary anticipation is to keep costs within the budget, but when additional resources (financial technological or human) are requested, they take time to process, which have implications time allocated for a project. Consequently, this can have an impact at a departmental level where saved costs for other projects can be impacted. At a project level, for the PMS project, although there were budget cuts by the QF, the resources were sufficient and supported completion of the project. However, for the PMS project, members pushed themselves to work beyond their capacity, and perhaps outside their competency level to execute the project.

Innovation within the project: General factors

Generally, nature of the project influences the innovation side of it, as the resources (knowledge, time, budget, and workforce) required will have different impacts. The participants added that it is always preferred to finish projects with the minimal budget and shortest period possible. More importantly, having deadlines can ensure that the team is committed and work towards the completing the project within the budget. As for NIS project, no time limit was set to finish the project, hence no pressure imposed on the project team.

The above shows that the nature of the project and its allocated resources will directly influence the innovation side of it. Deadlines act as achieving targets to ensure that the project consumes minimal budget and shortest time possible. However, for the NIS project, as no time frame was given, the team had the freedom and perhaps the space to embed more innovative elements within the project.

Innovation within the project: Management and leadership

Within PPE department, and reflecting on role of the management, it was stated that "*Those are that key enablers without them nothing can be accomplished because we can't work*

individually it's like a circle each one is working or reporting to another person" (PMS, OS). According to one of the participants, it was stated that approving a project goes through several stages where the case for the PMS project was nearly two years until it was approved. Each project gets allocated a sponsor who acts as the directors and plays the role of communicating the message from and to higher management, and also supporting the engagement with relevant parties to the project. For the PMS project, the higher management's involvement was through workshops in order to communicate the idea's relation to QF strategy and how it sits according to different KPIs. In addition, an evaluation framework was presented to illustrate a more-structured approach in terms of how it relates to the overall QF Strategy. On the other hand, when a project is driven by higher management, then the strictness on progress and deadlines is higher, and this was the case for NIS. The NIS's idea was in fact initiated by the management, and this was based on the available data related to policies and budget within the department. Moreover, the idea of NIS was seen as a part of a national system, which aimed to coordinate the R&D data within organisations.

It can be summarised that the management support defines project's goals, drives innovation, monitors progress, makes decisions, ensuring a good reputation of the project and more importantly empowering the team. For new ideas, although management take up the role of providing case justification, the process can be lengthy, which for instance was the case for PMS project. For the PMS project, the management's involvement was through workshops to ensure effective communication as well as an evaluation framework for alignment with QF strategy and KPIs. In cases where projects are driven by higher management, which was the case for NIS, then the strictness on progress and deadlines is higher. For the NIS project, the idea was initiated by management, which was seen as part

of a national system, and similar to PMS, the management's involvement was through KPIs, alignment to objectives, and this was essential as many ideas took a bottom-up approach.

Innovation within the project: Employees and teams

Within the PPE department, the team's approach tends to be proactive through establishing an effective line of communication, identifying tasks and maintain organised manner in the way that tasks are executed. In fact, the role of employees has a major impact on innovation, as it affects not only the final output, but how the final project can be improved and optimised later in the future. In fact, one of the participants indicated that employees and teams are seen as the project owners, and it is about dividing tasks accordingly and ensuring an effective line of communication. More importantly, collaboration is embedded within the team and even when iterations take place, the whole team is informed and updated so that everyone can contribute towards progressing the project and finishing it within the required time.

Within the department, the employees' and teams' approach is collaborative, proactive through the communication mechanisms, and maintain organised manner when executing tasks. During any project, if changes take place, the whole team is informed, and individual tasks are updated in order to complete the project within the required period.

Innovation within the project: Cross-collaboration

For the PMS project, the main involvement from another department was the IT, which was mainly for the database, but generally the project did not require collaboration with other departments due to the nature of the project. The participants stressed the need to involve business users in order to understand their needs, and validate the designed system, where for NIS, the project engaged different representatives, as the project touches on every

function within R&D. The NIS project was seen as a collaborative project as it involved policy planning and valuation department. However, there is another level of collaboration, which happens at a higher management level where critical decisions are being made. In fact, due to nature of the project, it was indicated that "*Actually this project was collaboration between and the policy planning and valuation department. So yes we get involved, but it depends. So, I could say that such activity happens with our department higher management more*" (NIS, OS).

From the above, collaboration is generally seen as a beneficial element, as it allows sharing experiences, and understanding different stakeholders' needs and requirements. For the NIS project, it was essential to engage different representatives to understand their needs, but also needed to involve higher management for critical decisions. On the contrary, the PMS project, and due to the project's nature, it did not require collaboration with other departments beyond the IT department.

4.7.3. Stages of innovation

Idea generation: project scope

The participants highlighted that in PPE department, employees are always encouraged to propose new ideas, and perhaps demonstrate their excellence, and to make the process effective, this is done in small teams so that the line of communication when an idea is proposed can be managed effectively. Although most projects need to demonstrate their alignment with the QF strategy, the project can still commence if it aligns to a lower-level strategy, which in the PMS project case was alignment to the R&D Strategy. The initiation of the PMS was as a proposed solution to a problem that was faced when evaluating and recording all projects under R&D where the existing process was lengthy and not effective

when managing multiple projects. It was stated that "*the project ideas come from their management so top down or bottom up…. It is a started based on an issue so there was a problem that we wanted to solve and the problem was to consolidate the planning exercise under one platform*" (PMS, MM). In refining the project's scope, a workshop was used as a medium to communicate the business plan, strategies and objectives with the higher management, and also the employees' perspective was taken into account. The NIS project was proposed from QF higher management as an idea to encompass R&D data from different departments, and more importantly, the idea was seen as part of a national system.

Conversion: culture and working mechanisms

In the PPE department, the participants stated that the working mechanisms within the team were flexible, but major decisions had to be taken by the higher management. For PMS project, it was recognised that identifying the appropriate working mechanisms to execute the project was the most challenging task within this project. Consequently, based on the available budget, to meet the project's requirements, a vendor was selected for the deployment of the project. In executing the project, sharing good practices was essential and reflecting on that, one of the participants stated, "*While working on this project my colleague and me shared the best practices to implement the performance management systems and there is a lot of reading being done to learn about it*" (PMS, OS). In fact, the project had to maintain the balance between tracking progress by the project director and working closely with the strategic planning division at QF who acted in a higher management role within the project. This was seen essential, as one of the participants stated, "*You can get the idea from anywhere from your theme from other entities; ideas are everywhere but implementation is difficult and important part because it requires managing people and*

assigning and involving the right competencies and managing the time to meet the deadlines" (PMS, MM).

As for the NIS project, the idea of the project began by searching for existing models, and how it can fit with QF, and then vendors who can design the system were investigated "*As I told you that the project was done with the strategic planning division of QF which is actually setup that deployment plan for the whole Qatar Foundation organisation, so there yet we had to deal with them a lot and report on how we are doing as R&D in terms of implementations and collecting data*" (NIS, OS). For the NIS project, the most important step is to find requirements especially for projects that requires heavy use of technology. In terms of sharing knowledge within NIS project, one of the participants stated, "*In term of getting knowledge from outside in you can get but knowledge sharing we don't have a knowledge sharing the platform but we do share our experiences and knowledge whenever we need to*" (NIS, OS). It was also added that the idea was refined by looking through existing models, how it fits with QF, identifying initial requirements, developing a prototype, and searching for vendors who can design the system. It was highlighted that the most important step was identifying requirements, hence the team provided a holistic view on the whole process to proactively tackle potential issues.

From the above, it can be recognised that within PPE, the mechanisms for executing projects, although flexible, maintains formality and have QF higher management involved. For the PMS project, it was important to identify appropriate working mechanisms to cope with challenges of the project, and hence, it was important to maintain sharing good practices between team members during execution. As for the NIS project, and for efficiency, the team commenced by exploring similar models that can be used to start the project but engaging with management was a key when executing the project.

Diffusion

The initial idea behind the PMS project was to produce a management system for the PPE department, but as its value got recognised by QF, it became part of the managerial process within not only R&D but also all over QF. The project team highlighted the importance of identifying the need upfront to target the right audience in the market. Thus, the project had pilot testing before it was launched to highlight issues, potential challenges and areas for improvement then it was implemented across QF. On the other hand, NIS project was not diffused, as it was put on hold due to restructuring.

4.7.4. Innovation Performance

Impact, value and evaluation

For the PMS project, the system developed was seen as successful, because their impact is now at an organisational level where it became part of a larger process rather than departmental. The participant added that the project has resulted in a new business practice and a decision-making tool. The project imposed an effective level of innovatively in terms of managing projects especially within a new field such as the R&D, which is considerably newer. The developed system has supported a more objectified measures of the success of projects rather than the high level of subjectivity that was highly reliant on the available content. In addition, it allows interferences from higher management in a structured and organised manner to projects within R&D, and this support early detection of issues, and more organised process, which later got extended to include projects across QF. Due to the fact that PMS project is in department that operates directly under QF higher management, Key Performance Indicators (KPIs) were used for evaluation. As for the NIS project, although it was seen as a project with major potentials, it was put on hold at the end due to

restructuring. However, at the initial stages, it lacked the vision, and this caused many delays because decision was not made on the vendors who will support carrying out the project. Another reason for delaying NIS, before putting it on hold, is the length of operating cycle process in QF, which often causes issues in terms of procurement. According to one of the participants "*One of the major reasons I would say is that it was delayed and could've started much earlier and the reason was because of the lack of vision of the National Information System*" (NIS, SM). This can be reasoned by the policies in place, which are rigid and do not take into account different departments' needs and requirements, and this has been causing issues within projects. Thus, it was stated that policies should be continually reviewed and if necessary, provide further clarity on them, or make some of them more flexible.

4.7.5. Summary and conclusion

Referring back to the framework, the NIS and PMS case studies draw further understanding of innovation within projects, which provided different angle compared to what was perceived with the AIDR and Jalees case studies. The main point to recognise is that although the PPE department acts as a research institute, it also occupies a managerial role by coordinating and managing other research institutes, such as QCRI. The impact of this is significant because it provides the setting of the department's vision and strategy by QF (when compared to QCRI) and can also explain the department's structure being top-down. In this department, projects/ideas can be initiated by teams/employees, which was the case for PMS project or QF higher management, which was the case for the NIS project. As shown in the analysis, in the case of top-down projects like NIS, identifying project requirements was one of the issues, as the team/employees had to identify it, but with keeping the project within the allocated budget. In the PMS project, however, the challenge

was different where the team/employees had to adjust the project's requirements to suit the budget. At a project level, the PMS project did not lack the resources when compared with NIS project that lacked vision, hence many uncertainties surrounded the allocation of its resources. The management's involvement was perhaps high for both PMS and NIS project where this is reasoned by nature of the department, and impact of projects on other departments.

It can be stated that, reflecting on PMS and NIS projects, innovation within PPE department is more management-based, which targets improving existing operations within QF. Both the PMS and NIS projects were recognised as projects with huge potential, but only PMS was implemented, and its impact is cross-departmental, where if NIS was implemented, its impact could have been extended to a national level. It can be highlighted that understanding requirements is one of the major elements that impact a project within PPE, as this will certainly have an impact on execution and the working mechanisms within the department.

4.8. Facility Management (FM) case studies

VTS case study

The VTS (Vehicle Tracking System) is aimed at serving the needs of students on campus. This is mainly utilised in order to be aligned with punctual availability of vehicles at the bus stop, which ultimately affected the students' timely arrival or departure to and from the campus. It was anticipated the VTS would bring all the vehicles on track, for instance the performance quality of the drivers would be monitored in real-time. VTS also aimed to serve the need for managing the fuel consumption of all the vehicles, since the drivers were reported to cheat on fuel tank filling. Accordingly, these aspects turned out to be the rationale for VTS, and the request for such a system was put forward to the management. On the

approval of the requested process innovation, the corresponding activities were also initiated, for instance, the vendors' selection, procurement plan, amongst others.

The overall organisational scenario seemed to favour the process innovation of VTS integration into the fleet management. Despite that the VTS plan was in its final stage, QF devised the Smart Project. The Smart Project was emphasised to be carried out as a priority, and thus, the ongoing VTS plan could not be preceded as an individual project. Nevertheless, it was said that the Smart Project would incorporate the vehicle monitoring system. Afterwards, there were certain budget-related or restructuring issues that caused Smart Project to be put on hold, and thus, VTS was also compromised. VTS could have been a successful attempt to innovating the process of fleet management, but it could not be achieved. Three key personnel were interviewed to gain insights into the key organisational antecedents that might have led the innovation to failure: one senior manager and two middle-level managers and a team leader.

CAFM case study

CAFM (Computerised Aided Facilities Management) represents a successful attempt to process innovate (typically used in order-process departments), responding to the need for automated report generation. Previously, work-related reports used to be prepared manually using MS Excel. Facility management (FM) had undergone downsizing in the response to the change management, while the workflow was increasing with the increasing number of facilities over time. As a result, there were ambiguities in the performance outcomes as compared to the expected results, while the processes were more time-consuming along with causing increased workload. Therefore, the CAFM system was offered as an effective solution to the FM department of QF for managing the operations in a reliable, accurate, and

speedy manner. MEEZA, being the premier provider of IT services and solutions in Qatar, has deployed CAFM system as the Archibus software, which is proficient in serving the FM's need for managing the daily operations across preventive maintenance, planning and development, landscaping, transportation, office services, etc.

The CAFM system was first deployed as a pilot study, in which the implications of the system were assessed across two facilities. The system was then deployed throughout the facilities at FM, as all the bugs or errors were removed during the transition phase. Accordingly, the typical scenario of increased workload diminished, and the credibility of the services is enhanced. Even though this particular process innovation at FM has been a success, the proceeding section presents the investigation of the overall scenario in order to identify the key antecedents, which made the process innovation a success. Five key personnel were interviewed representing the key roles at FM which include Operational and Maintenance Director from the senior management, Head of planning and scheduling as the Middle-level Manager, two Engineers from the Operational Staff (E1 and E2), and a Business Analyst (BA). The summary of participants is given in Table 10.

Table 10: Participants' roles for both VTS and CAFM projects

Projects	Participants Role
CAFM	Engineer (E)
	Engineer (E)
	Middle Manager (MM)
	Business Analyst (BA)
	Senior Manager (SM)
VTS	Team Leader (TL)
	Middle Manager (OS)
	Middle Manager (MM)
	Senior Manager (SM)

(Source: the researcher)

4.8.1. Firm-related antecedents

Organisational vision and strategy

According to one of the participants, it was indicated that QF's vision supports the department, in delivering a quality service to the end users, hence it is reflected within the department. The FM department's structure comes from QF and has standards, guidelines and policies that align with the QF vision and mission. It was also added that the structure of the department is arranged in a way that does not impose challenges on the manager, and makes every member understand their duties. Furthermore, the structure within this department is well defined and represent a team where the information flow is in both directions: management information that comes from the top, and operational issues from the bottom. In fact, reflecting on information flow, "*It's from both ways from top down and bottom up. Top down in the sense related to Information flow. Bottom up means it's a feedback and top down as the information given*" (CAFM, E2). The projects proposed have to be aligned with QF's objectives, vision and strategy where ideas are often top-down by QF higher management.

It can be summarised that, despite nature of the department, the organisational vision and strategy have a direct impact on structure, standards, guidelines and policies of the department. In addition, the structure is arranged in a way that allows different individuals to understand their duty, supports understanding information flow (management from the top and operational from the bottom), reporting issues, and decision-making processes. In terms

of projects, they have to be aligned with QF's objectives, however, ideas tend to be driven by management, and not necessarily the strategy of the department.

Collaboration and Culture

It was argued that nature of the department imposes certain collaboration mechanism between the teams. The participants added that the collaboration is operations-dependent where and follows clear process that allow efficiency and effectivity. At an outside (with other departments in QF) level, and reflecting on CAFM project, although the CAFM system had a clear direction in terms of its aim to become implemented at wider scale, its vision and long-term value should have been driven by the management, and this could have improved collaboration with other departments. Reflecting on collaboration within the CAFM project, for instance, "*So, the CAFM is an internal project today definitely plays a role as I told you previously you can Make It or Break It as simple as this*" (CAFM, SM). Within the department, the culture is according to participants is open, and this allows sharing issues and problems, which is done through a system in place that support tracking the problem whether at an individual of team level. However, it was indicated that one of the areas that the department needs working on, due to time limitation, is the openness with end-users, because this will support providing better service. Elaborating on this "*I think they have an environment that it is easy for them to work together if needed however as I said each one has his own task that they concentrate on daily*" (VTS, MM). To maintain and improve collaboration culture within the department, the management is driving more team building exercises as a way to solidify the understanding of policies and procedures of QF.

From the above, it is realised that collaboration within the department is more structured and operations-dependent, which provides better mean for efficiency and effectivity. As for collaborations outside the department, it follows certain mechanism (focal point), which can be limiting. This has an impact on projects, which was the case in CAFM where although it had a direction, the management should have strategically included other departments in order to be more impactful. The department maintains an open and transparent culture, which allows sharing ideas, and issue tracking whether at individual or team level. It was also added that managers interact with employees on regular basis to discuss operations, procedures of work, highlight issues, and communicate different matters from management to employees.

Resources and competencies

For the nature of this department, skills and knowledge set are vital to maintain the ongoing operation, and this is one of the metrics that is taken into account when contracting any work outside the department. From the management perspective, it was stated that the department requires a variety of expertise, and this is essential because of nature of the department. Hence, the department includes individuals from different backgrounds and expertise, and it was highlighted that it will be difficult to attain those with no competencies, as the period that will take them to learn and develop can be long. In fact, it was claimed that advancing innovation highly depends on level of competency and familiarity with the existing processes. On the other hand, one of the participants stated that although competencies are seen essential from an organisation perspective, performance and output is what should be measured from an employee perspective. For the CAFM project, the resources were already in place, as the project primarily aimed to automate the manual processes, which mainly requires some familiarity with the system. However, in cases where

budget cuts occur, the projects often are pushed to external vendors, and although this is manageable, it requires careful assessing of their competency to deliver the project. In fact, one of the participants highlighted that "*Relating to the resources it's not just due to the budget cut, but generally it is not easy to find a good quality sources form IT perspective*" (CAFM, BA).

From the above, it can be realised that within the department, knowledge and expertise are essential for the ongoing operations. Although competencies are essential, and supports advancing innovation from the management perspective, from an operational perspective, it was highlighted that performance and output are what matters when projects are executed. Resources' availability is essential, but when budget cuts occur, projects tend to be pushed to external vendors where for the CAFM project, resources in terms of human power existed as the main objective was to automate some of the manual processes.

Governance and policies

From one of the participant's perspective, policies within QF are seen appropriate as they include multiple entities where some entities have their own policies; thus, it is important to have an overarching set of policies to maintain the identity within QF. According to one of the participants, it was highlighted that when an issue or request is raised, which is typically from bottom to top, it needs to go through a number of approvals, so in the case of CAFM for instance, most improvement suggestions are around operations, and in many cases, a request can be pending for a long time. At a project level, the nature of project dictates the resources that can be provided, and this differs if the project is coming from the department or coming from higher management. In fact, it was claimed that one of the main challenges

is about acquiring resources for projects, and the fact that existing policies do not support temporarily appointments from outside QF.

It can be summarised that QF's overarching policies is seen essential in order to have standardised reference that departments can relate to. However, policies are perceived as inflexible in terms of the approval process, which can impact projects when issue is raised, or financial support is requested. Furthermore, the rigidness of QF policies impose a major challenge especially when changes for policies within the department are requested, which is the case within FM department.

4.8.2. Project-related antecedents

Project Resources

Within the FM department, financial resources are seen as the one with the most significant impact. According to one of the participants, it was highlighted that using the resources efficiently and particularly financial resources is vital in a project to ensure that it can be delivered. In fact, within the FM division, due to the budget cuts, it was highlighted that necessary restructuring, realignment, reprioritisation, review of objectives and KPIs took place to cope with the new situation. From another angle, in the department, there was a major cut in terms of reducing the manpower, and this imposed many challenges. Consequently, this has influenced the level of service that the department used to offer in the past such as high level of maintenance for buildings, response time, and request handling. However, the teams were coping with these challenges to provide a better service. At a project level, for the VTS project, resources for the project were available initially, as the original plan was to go down the procurement tendering route. In fact, for the VTS project, maintenance was one of the complexities encountered, as the number of staff in

that area were reduced. Moreover, the project was kept on hold due to restructuring within QF Smart, and another difficulty was the budget. Similar to the VTS project, and due to the major manpower cut, the CAFM system did not benefit from many individuals who had the expertise of carrying out the transition of the manual processes into automated, and the reliance became mainly on the supporting partners. This has indeed impacted the project, as one of the participants stated "*The CAFM system was implemented before the budget cut, but in that case a lot of people were moved so we lost people who are supposed to improve the system. We ended up with the system that is having some limitations but we are working and coping with these limitations. If those people were still here we would have been in a much better condition*" (CAFM, E2). However, according to one of the participants who represents management, the manpower cut did not have direct impact on CAFM as a system, but it imposed more pressure at a managerial level in terms of handling and logging requests.

From the above, financial resources can be seen as one of the factors that have a significant impact, which resulted in restructuring, reprioritisation, review of objectives and KPIs within the department. In terms of human resources, at a department level, it can be perceived that the main impact of major manpower cut is on the level of service provided such as service coverage, response time and request handling. In the case of VTS project, the issue of manpower cuts did not influence the project, as it was going to be procured, but the restructuring within QF held the project from going ahead. In the case of CAFM project, and opposing to VTS, manpower cuts resulted in loss of essential expertise, which imposed the need for the project to be reliant supporting partners. Furthermore, the major manpower cut has negatively influenced interaction with end-users. On the contrary, the management indicated that the only challenge of the manpower cut was on handling and logging requests.

Innovation within the project: General factors

According to participants, size and nature of the project have a direct influence on the resources required. In fact, every project gets a framework, which supports identifying critical tasks and deadlines. Reflecting on VTS project, meeting deadlines was important, and this was acknowledged by one of the participants who stated "*We actually have deadlines, but it is so hard to keep on with the deadlines because most of QF projects are integrated with many departments. So, it's not only your department who is going to manage the project, but you will have other departments mainly procurement, Finance and maybe others*" (VTS, SM). The allocation of available manpower on multiple projects, especially those with IT skills, can influence a project's output and determination of the individual who works on multiple projects because the emphasis will be more on the delivery not the quality. Perhaps, in some cases, limiting time on delivery can be advantageous especially in situations where a project (which was the case for CAFM) has to be implemented at a wide scale, so the team will understand that losing time can have major impacts. For the CAFM project, all team members were involved, as they were familiar with the system and how it operates.

The above showed that innovation within a project is impacted by many factors including nature of the project, size, resources, and time required. Outlining a framework for delivering a project is perhaps essential and can support identifying critical deadlines. Although having deadlines may be advantageous to ensure delivery, in many cases the deadlines are not met, and this can impact other departments. It was also highlighted that over allocation of manpower resources may result in poor quality. For CAFM project, the most important factor to ensure success of the project was familiarity with the system.

Innovation within the project: Management and leadership

For projects in the FM department, managers act as advisors focusing on tasks to be done and how long they will take, and this is often monitored at timely periods. In fact, one of the participants indicated that management's involvement differs, which can be continuous, when sensitive matters arise, or in supporting understanding different mechanisms in terms of process improvement. Furthermore, managers' involvement especially in decision-making is vital, but many decisions can be taken by employees as long as they do not have major financial implications. According to one of the participants "*Yes they do engage a lot because they want also to ensure that certain things are carried out the way they should be because at the end of the day it will reflect them it's not only the operation or the administration*" (VTS, TL). In fact, the management indicated that size and nature of the project can influence level of decisions that can be taken by employees, and in case where projects have an influence on other departments, decisions are mainly taken by top management. Although employees are encouraged to innovate, and being supported by management, delivering a good project has major reliance on management, as they set the objectives and vision for a project. On the managers' role for employees, it was stated that getting feedback from management act as a motivation to employees and empower their abilities. In the case for CAFM, management provided the support as well as direct the team at different times within the process, and usually this happens through scheduled meetings. In fact, another participant stated that management is seen as over involved in many cases where this imposes more pressure, and perhaps cause issues especially when reporting issues, as some managers report directly to the senior management before fixing the issues internally.

It can be summarised that management has a direct impact on projects, which can be in terms of involvement, decision-making or drive innovation. In terms of involvement, it can

be when sensitive matters arise, early stages of a project, support understanding different mechanisms in terms of process improvement or communicating changes from management. For instance, in the case of CAFM, management provided the support as well as direct the team at different times within the process and requested end-users' feedback to evaluate quality of the project. In terms of driving innovation, although management support new ideas or changes from employees, the process of approval is considered lengthy and perhaps requires multi-approvals, hence, changes or new ideas often are driven by management.

Innovation within the project: Employees and teams

According to participants, meetings occur on daily basis to discuss ongoing progress, raise matters, and depending the criticality of the problem, appropriate decisions take place. More importantly, and due to nature of the department, each employee needs to focus on a particular task, but they support each other when needed. Daily meetings take place to discuss issues and raise it promptly to management if needed. Furthermore, new ideas are generated in team meetings are some ideas are seen as excellent potentials to improve daily operations. Within the department, communication flow is the key especially within this department, so when an issue is logged, all the technical staff are notified and added in the email thread to follow. Over the years, the department evolved a good working mechanism where different technical staff understand nature of the job required, and in many cases, the staff can perform each other's job. In fact, the technical staff highlighted that the team maintains a role exchanging mechanism, and this is mainly to improve skills and develop additional competencies.

From the above, it can be realised that meetings take place within the department in order to discuss daily operations, raise issues and propose new ideas. The participants also highlighted that the nature of the department imposed role-exchanging mechanism in order to improve skills and develop additional competencies.

Innovation within the project: Cross-Collaboration

This department provides services (e.g. Facility Management) to other departments, so collaboration whereas if a project requires procurement then HR or finance get involved, hence the need for cross-functional team becomes essential. The department meets on daily basis, and the communication is often informal to maintain friendly work environment. At an organisational level, cross-functional teams often collaborate in big events where they can share experiences. In fact, due to nature of the department, current collaborations happen at departmental and cross-departmental levels where this is due to the nature of the department, which requires interaction with many end users. The CAFM project involved employees from different teams such as the IT team, the maintenance team, the operation team, and the contractor awarded to contract to implement the project, and this multi-team integration were essential to do many tests runs and receive feedback from top-down. For the CAFM project, a task force team from different teams was created, and this was essential because the top management considered the project as a priority. On the contrary, although within the FM team, there is a wide involvement of different teams, integration of other teams including IT and customers are still limited, and often are notified of any changes, but do not have an input for the change. This was further explained as one of the participants stated "*Within the FM I think they are probably having regular meetings which we are not attending, so now when there is any change in the process we ask them to invite us as IT in those*

meetings but it hasn't happened yet. I think this cross-departmental collaboration is underestimated" (CAFM, BA).

It can be summarised, that collaboration is an integrated element within the department, but at a cross-departmental level depends on nature of a project. For instance, within the CAFM project, a task force team was created, which involved the QF employee team, the IT team, the maintenance team, the operation team and the contractor implementing the project. However, one of the participants highlighted that integration needs improvement to include other stakeholders such as end users to improve service level.

4.8.3. Stages of innovation

Idea generation: project scope

Generally, there are factors that impact the project initiation including size, purpose, and service to the end user, available resources and how they fit, with the exception if a project is to be outsourced. More importantly, there are some aspects within the higher management's strategy, which is shared with employees because it will support driving innovation, and employees can provide feedback on these aspects if they need to be changed, expanded or presented differently. In fact, one of the participants stated, "*Usually we put the business plan, me and the supervisor of our transportation department because we are familiar with the operation work and the admin work as well*" (VTS, MM). In fact, QF encourages employees to innovate, and reward them when they do in different ways such as employee of the month, or the QF's award (Thanaa), which is given for those employees who 'did the extra mile'. The idea of CAFM was initiated as a way of reducing workload and perhaps automate processes so that it is easily tracked and recorded. Within the department, there is a business plan, which is set by the directors and it draws a wider

picture of how things should improve where this was the case for CAFM in terms of going from manual to paperless processes.

The above shows that project's initiation can be influenced by many factors including size, purpose, service to the end user, available resources and how they fit, with the exception if a project is to be outsourced. It can also be stated that projects are often driven by higher management. At the start of a project, directors put a business plan together and this was the case for CAFM project, which aims to reduce workload and perhaps automate processes so that it can easily be tracked and recorded.

Conversion: culture and working mechanisms

The participants stated that knowledge sharing is essential as within this department different individuals have different expertise, and part of skill development is to improve different competencies. The main knowledge that needs maintaining is the in-house training by QF because it includes the procedures that need to be followed, and also there is a budget allowance if any additional training needs to be taken. There exists an electronic database which is accessible to employees, and this can ease the process especially when looking for particular information.

For the VTS Project, it went through the tendering process, and got outsourced to a company for trial before taking the decision to make it as part of QF Smart Project where it ended up being on hold. It was highlighted that for the execution, there are always control measures to keep the project on budget and on track. For the VTS project, one of the participants indicated that the team has the freedom to utilise the appropriate mechanism in driving the project, but major decisions required approval from higher management. It can be summarised that, for the VTS project, the execution mechanism was initially proposed by

the team, approved by management, outsourced to a company and then tested through a pilot study. In fact, although the team has the freedom in deciding an appropriate mechanism to drive the project, there are control measures to keep project on track, and major decisions have to be taken by the management. The team had maintained collaboration in order to understand progress and reduce workload, but the collaboration was primarily within the team not with external partners. As the project was mainly implemented by operators and engineers, the culture of the project maintained flexible working mechanisms with weekly and monthly reporting, but if a critical decision that has major implications on the overall scope is required then it needs to be processed by higher management.

For CAFM project, planning the process of execution was very important because this was influenced directly by the resources available, for the project, it was important to reprioritise tasks, as meeting the deadlines was crucial for the end users. More importantly, one of the participants stated, "*The staff are using the CAFM and then we are using the daily report to report whatever problems are issues appear on daily basis, as this is required by higher management*" (CAFM, E1). The project consisted of six stages: coordination, allocate tasks to the IT department, procurement, deploy the system, simulation of the system, and system implementation. The management indeed highlighted that pilot testing was seen as the most important because it was the prompt alert to make any necessary changes before moving from one phase to another. For the CAFM project, the execution process was primarily impacted by resources available, project nature, meeting deadlines for end users and business case. The CAFM project went through pilot testing and this was across different phases (coordination, allocate tasks to the IT department, procurement, deploy the system, simulation of the system, and system implementation) of the project. In terms of workflow, although there was a degree of flexibility in making decisions and working mechanisms, the

FM team were evaluating fulfilment of the requirements, and approving most decisions. However, it was highlighted that not involving end users was one of the shortfalls during execution of the project.

From the above comments, it is realised that within the department, knowledge sharing is essential between team members especially for skill- and competency-development. More specifically, the participants indicated that in-house training is the most crucial knowledge needed, as it outlines policies and procedures where any additional training need to have strong justification. For VTS project, the working mechanisms were flexible whereas for the CAFM project, it required planning and sharing the execution plan with management was crucial to ensure fulfilment of the project's requirements.

Diffusion

According to participants, the VTS project was pilot tested on 40 vehicles, and the plan was to install the system on remaining vehicles to avoid potential misuse. However, it was not completed due to organisational restructuring, and hence the project was put on hold. As for the CAFM project, the project was tested on two facilities and this allowed ease of adjustment if required before implementing the system across QF's different facilities. The CAFM system could be considered to be sensitive, and a mistake can disrupt others' work, hence it was important to test the system to detect issues. The CAFM system was then implemented across the different facilities which enabled the FM team to provide a better service within the organisation.

4.8.4. Innovation performance

Impact, value and evaluation

The majority of participants agreed that VTS was an opportunity to provide more effective and efficient method for managing vehicles within QF, but incomplete due to restructuring and VTS impact was not seen. For CAFM, its implementation across different facilities showed its impact as a new process and business practice that provided more effective and efficient operational process that replaced old manual processes within the FM. It helped the FM to enhance the services they provide within QF. Generally, within the department, there exist no formal method to evaluate projects, but it is 'all about achieving goals.' Monthly evaluation sheets are used as one of the measures for evaluation and identify areas for improvements. For both CAFM and VTS projects, the evaluation is primarily based on end users' feedback, and this is analysed by the department for improvement purposes. Although, the CAFM team faced challenges after cutting down the staff number, they were able to provide their service across QF.

4.8.5. Summary and conclusion

The CAFM and VTS projects have reflected further understanding of a 'different in nature' department where higher management mainly drives projects. Unlike the QCRI and PPE departments, the FM department acts more of a 'service provider' within QF for other departments. At a firm level, and due to nature of the department, QF sets their structure, vision and strategy, policies and procedures. It is important to note that VTS and CAFM were more of a 'process-change' where VTS's rationale was for better process in managing vehicles within QF, and CAFM for effective and efficient operational process that facilitate providing services to end-users. Although there were budget cuts that imposed additional pressure to execute projects, management set milestones deadlines, and indicated different individuals' duties. Similar to PPE, the management was involved in most (if not all) decisions about projects and had to pilot test the project in order to detect issues and

highlight any necessary changes. The team/employees' role, in addition to carrying out projects, proposed a number of changes (particularly in CAFM) during project execution, but most of these changes had to be escalated to higher management for approvals. Although collaboration is a running thread across departments within QF, it was highlighted that the current mechanism for collaboration within FM needs improvement to engage end users for feedback. Within the department, employees are expected to have a role-exchange mechanism in order to develop their skills and competencies, which can be reflected on output and performance of the department.

It can be stated that, based on VTS and CAFM projects, innovation within FM department is process-based, and driven by QF higher management where both projects were recognised as improvements to existing processes within the department. The CAFM project was implemented and considered a success as it provided more effective and efficient operational process that helped in enhancing the services provided by the FM. As for the VTS project, although project had great potentials, it was not implemented due to organisational restructuring, although it was initiated to provide a more efficient and effective mechanism of managing and tracking vehicles within QF.

4.9. Chapter conclusion

This chapter presented case-based analysis using themes for the six case studies investigated in this research. Each two case studies were presented together based on the department they belonged to, which respectively was the in the order of AIDR, Jalees, PMS, NIS, VTS and CAFM. The main themes were based on the framework developed in Chapter 2: firm-related antecedents, project-related antecedents, stages of innovation and innovation performance. The analysis showed that there are differences between different

cases, which can be reasoned by the project itself, the department or the impact on the organisation in some cases. More importantly, these differences, at an abstract level, can be spotted through some of the questions asked to each of the case studies. For instance, when asking about the resources' availability impact on projects, and based on participants' responses, the findings show that majority of projects were impacted with the exception of PMS. Perhaps when participants were asked about the elements that are considered when proposing or initiating an innovation project, the majority of responses showed that alignment with overall organisation strategy, collaboration between managers in projects related decision making and being fitted with its resources and competencies are all considered. However, through the analysis the impact of each of these factors have indeed differed where this will further be explained when conducting cross-case analysis in the next chapter. The impact of all projects has indeed differed, but this can be reasoned by nature of the project, and also whether it was bottom to top or top-down, which will further be discussed in the next chapter.

Chapter 5: Cross-Case Analysis

5.1. Introduction

As shown in the methodology, the findings and themes were drawn from the conceptual framework, the data, the analytic process and the specific stages of data organisation using the well-known data analysis methods proposed by Miles and Huberman (1994) and Miles et al. (2014). After initially summarising the data using first-order codes, pattern codes (second cycle codes) were used to group the summaries into a smaller number of categories and themes which were then analysed using thematic analysis by means of a thematic network. These second-cycle codes are explanatory codes used to identify an emergent theme, configuration or explanation by sorting the data from the first-order codes into more meaningful units of analysis, which helps lay the groundwork for cross-case analysis by surfacing the common themes and directional processes (Miles et al., 2014).

Studying multiple cases using a cross-case analysis increases the credibility of the results and findings as it increases the confidence that the events and processes in a particular case are not wholly idiosyncratic (Miles et al., 2014). However, a more significant advantage of using a cross-case analysis is that it helps to deepen understanding and explanation through pattern matching (Ghauri, 2004; Miles et al., 2014). This is because a comparison across multiple cases can help find the specific conditions in which findings occur and also identify the general categories of how the conditions can be related. There are 2 general approaches described for a cross-case study by Miles et al. (2014), namely a case-oriented approach and a condition-oriented (variable-oriented) approach: the case-oriented approach considers the case as a whole entity and searches for configurations, associations, causes and effects within the cases while the variable-oriented approach is a

conceptual approach that uses variables and their interrelations rather than cases as building blocks for the study.

5.2. Chosen approach

This research study initially used a framework (see Chapter 2) to rationalise the aspects underlying the data collection where the researcher thematically categorised it into firm-related, project-related, stages of innovation, and innovation performance. The thematic analysis in the previous chapter unveiled many complexities, which require using robust cross-interferences to understand these complexities. Therefore, the cross-case inferences will be based on three levels: organisational, departmental and project, as this will support capturing holistic aspects that support informing and enriching the framework within this study.

5.2.1. Cross-case analysis (setup and coding)

The initial step towards the cross-case analysis is to present the setup on which the cross-case analysis will be based. The main themes (firm-related, project-related, stages of innovation, and innovation performance) were identified with the sub-themes and categories (organisational, departmental and project) on which the cross-analysis is based. Within each of the sub-themes, an aspect or multiple aspects will be discussed within the comparative analysis, which mainly will be based on the analysis presented in the previous chapter. It is important to indicate that the corresponding level (organisational, departmental or project) to each of the sub-themes is based on the researcher's knowledge, experience and abstract conceptualisation of the interpreted findings from Chapter 4.

For each of the levels (organisational, departmental and project), the cross-case interferences will be based on the sub-themes where some will rely on sub-theme level 1

and others will rely on level 2. It is important to indicate that, when performing the comparisons, department names in which the six projects were under will also be used. The departments are QCRI (for AIDR and Jalees), PPE (for PMS and NIS) and FM (for VTS and CAFM). The researcher uses the conclusions from each of the sub-themes to shed the light on the cross-case interferences between the six case studies in this thesis. It is important to indicate, for the purpose of simplicity, and to avoid potential duplications, similarity in name sub-themes (e.g. resources, culture and collaboration) will not be duplicated and knowledge gained will be synthesised accordingly at organisational, departmental and project levels. Participants' comments will be used where necessary to provide an evidence on the aspect discussed where the coding for a quotation will be as follows:

- Case Study Name (e.g. AIDR, Jalees, PMS, NIS, VTS or CAFM)
- Participant's Role (e.g. **OS**: Operational Staff, **SM**: Senior Manager, etc.)

For instance, the quotation can be as: "the culture within QF maintains transparency" (AIDR, **SM**).

5.3. Organisational Level

Based on the analysis from the previous chapter, and although all case studies belong to the same organisation, the organisational impact has differed on each project (AIDR, Jalees, NIS, PMS, VMS and CAFM). This was captured through the following themes: organisational vision and strategy, governance and policies, financial resources and networking.

5.3.1. Vision and Strategy

Despite the fact that there are many departments within QF, and each project belongs to a department, the influence of QF's organisational vision and strategy differs on each project,

and this is dependent on nature of the department. In QF, the vision and strategy comprise of three main pillars: education, research and development and social development. Therefore, each department has to be aligned with one or more of these three pillars.

In QCRI, the department's vision and strategy, although had to be aligned with QF's vision and strategy under research and development pillar, was driven by the department itself. This means that any new project proposed by the department, beyond being aligned to the department's vision and strategy, has to align with the QF's vision and strategy before it gets approval for execution. To elaborate on this, one of the participants indicated

"*when we start a project, it has to align with the organisation strategy which is mainly research project, having the right people and the local and global impact*" **(AIDR, TL)**.

This means that the impact of QF's vision and strategy on projects within QCRI department, is on ensuring that scope of the project is serving QF's vision and strategy, and this has an impact on the projects. For instance, AIDR project was able to demonstrate how technology can support achieving social impact, which serves one of the main pillars under QF vision and strategy, hence the project was approved for execution. This is because it demonstrated alignment to the vision and strategy at both department and QF levels.

In the PPE department, the department's vision and strategy is derived from QF's vision and strategy. This is because the department's main role is managing other research institutes (e.g. QCRI) within QF. Within this department, projects can be derived by members of the department or the QF higher management. On the one hand, although projects derived from members of the department need to be approved before execution, the scope (e.g. PMS Project) is mostly aligned with QF's vision and strategy. This means, in comparison to projects in QCRI, projects derived by members in the PPE department face less challenges

when requesting the approval to execute the projects. On the other hand, when projects (e.g. NIS) are derived by QF higher management, who set QF's vision and strategy, then the project becomes a requirement to be executed by members of the department. In total, projects in the PPE department face less challenges when compared with projects in QCRI in terms of proceeding to execution. This is because in the PPE department, projects are often aligned to QF's vision and strategy, but in QCRI, projects need to demonstrate how they align to QF's vision and strategy, which set more challenges for the projects before execution.

In the FM department, and similar to PPE department, the department's vision and strategy is derived from QF's vision and strategy. However, the main difference is that the FM department acts as a service provider for all other departments

"*we are operation and maintenance we are basically service providers, so whatever is the Qatar Foundation vision it is our department's objectives which we call KPIs. So, they are directly aligned with the objectives of the Qatar Foundation*" **(CAFM, E2)**.

Therefore, projects in this department, are mostly derived from the QF higher management, which means, similar to some of the projects (e.g. NIS) in PPE, the projects become a requirement to be executed by members of the department. In total, projects in the FM department, face the least challenges when compared with projects in the QCRI and PPE department in terms of proceeding to execution. This is because all projects are in line with QF's vision and strategy, as they are driven by QF higher management. Table 12 summarises the impact of organisational vision and strategy on different departments.

Table 11: Summary of the impact of organisational vision and strategy on different departments within QF.

	Qatar Computer Research Institute (QCRI)	Policy, Planning and Evaluation Department (PPE)	Facilities Management (FM)
Organisational Vision and Strategy [1]	In this institute, they develop their vision and strategy which complement QF's vision and strategy hence the projects proposed have to align with both the department's and QF's vision and strategy. This imposes a longer approval process for the project and the project teams may face many challenges before proceeding to execution.	The department's vision and strategy are derived from QF's vision and strategy. Therefore, the projects proposed by the members of the department are often aligned with QF's vision and strategy, however they still need to go through an approval process before execution, which was the case for PMS project. But if the project is driven by QF higher management (e.g. NIS), it would be considered as a pre-approved or a requirement that should be executed by the members of the department immediately as it would serve QF's vision and strategy.	The department's vision and strategy are derived from QF's vision and strategy and the projects are mostly driven by QF higher management to serve the needs of QF. Thus, the projects are required to be executed by the department members and face the least challenges before proceeding to execution.

(Source: the researcher)

[1] These findings show that organisational vision and strategy is a highly dominant antecedent of innovation as shown in the conceptual framework. Its influence is dictated by the nature of the project and if the vision and strategy is driven by the department itself or from the QF as a whole.

5.3.2. Governance and Policies

The findings revealed an additional emergent theme from the conceptual framework that was seen to have a significant impact on innovation, namely the “Governance and Policies.” Within QF, and a common thread across departments/entities, the rigidness of policies in place had an influence on all projects investigated in this research. Based on the case analysis in the previous chapter, it can be stated that the influence is on resource acquiring, project progression, approval processes. In terms of resource acquiring, human resource acquiring was seen as a common issue across all projects investigated where this was reasoned by the QF policies in place. In QCRI, human resource acquiring had a direct impact on team members involved in AIDR and Jalees. This impact was in terms of imposing more pressure on the team, for instance, in AIDR, the number of staff members were limited, and obtaining additional human resource was considerably challenging due to policies in-place by QF. Similar to AIDR and Jalees, PMS project required additional staff, but could not be approved, and this impacted staff members in terms of imposing more pressure, which affected their work life balance. Despite the challenge of acquiring additional human resources on AIDR, Jalees and PMS, the projects managed to meet the deadline. Another impact of governance and policies was the new policies of allocating lower budgets to different departments within QF. This imposed a challenge on departments such as the FM department were many staff were made redundant, hence the department had undergone major restructuring. This affected CAFM and VTS projects, as the number of specialist engineers reduced, and their availability on site became limited. Consequently, sustaining high quality became challenging, and staff became more pressured to deliver service on time. Despite these challenges, the CAFM team still managed to deliver the usual services. On the other hand, due to the new policy of budget cuts, a lot of restructuring occurred in

different divisions, and unlike CAFM, VTS was one of those projects impacted by divisional restructuring because it was under one of the projects that got dissolved in the restructuring. To elaborate on this, one of the participants stated

"*The reason was that Qatar Foundation want to do a QF Smart project and the vehicle tracking system was part of this project so when they stopped the QF Smart project our project got on hold as well. Actually we wanted this project, but I could say that it's due to restructuring and budget control*" **(VTS, MM)**. Table 13 provides summary of governance and policies impact on different projects.

Table 12: Summary of the impact of governance and policies on different projects.

	Human Resource Acquiring	Budget cuts and Restructuring
Governance and Policies[2]	Team members for AIDR, Jalees and PMS projects faced additional pressure to execute the projects due to policies restricting the additional hiring of human resources, and this imposed pressure and affected work life balance.	A policy was applied to reduce budgets, and this caused major restructuring across different divisions within QF. The CAFM project was implemented despite the reduced number of staff members, but the team faced difficulties in sustaining service level, and had to work more in order to deliver the usual service. The VTS project did not go ahead as it was under a project that got dissolved in the restructuring.

(Source: the researcher)

[2] The emergent theme from these case studies is that the QF has a rigid policy base that inhibits innovation. Innovation is also constrained by budget cuts and restructuring that occur over the course of the project.

To sum up, it can be realised that the organisational level had an impact on all projects, whether directly (through governance and policies) or indirectly (through organisational vision and strategy). In terms of the direct impact, human resource acquiring, budget cuts and restructuring were the main influencing factors which, although did not affect implementation of most of the projects, imposed additional pressure on team members involved in projects such as AIDR, Jalees, PMS and CAFM. The reason for being able to overcome the challenges imposed by additional pressure was perhaps due to the high level of competency and commitment by different team members across these projects. On the other hand, the VTS project did not go ahead as it was under a project that got dissolved due to restructuring. In terms of the indirect impact, due to department nature, the impact of organisational vision and strategy had varied. In QCRI, due to the department's own derived vision and strategy, the projects (AIDR and Jalees) took longer period to be approved for execution, as they needed to demonstrate alignment to the QF organisational vision and strategy. In the case of PPE, the department's strategy is derived from QF vision and strategy, hence when projects are derived from the department (PMS), they are often aligned to QF vision and strategy, which although needs to be approved, it is considerably less complex when compared to QCRI. In other cases, when projects are proposed by QF higher management then it becomes a requirement for execution. In FM department, and due to nature of the department being a service provider, most projects are provided by QF higher management, hence they become requirement for execution. These are summarised in Figure 7.

Figure 7: Summary of organisational level impact on innovation.

(Source: the researcher)

5.4. Departmental Level

As drawn from the case analysis, it found that there are departmental (QCRI, PPE and FM) related aspects that influenced innovation projects. It was important to draw an insight into department-related aspects. In doing so, many aspects were captured within most of the sub-themes with the exception of many sub-themes as shown in Table 10.

5.4.1. Departmental Structure

Through the case analysis, it was recognised that different departments differ in terms of their structure where in this context, structure refers to order of roles and responsibilities and flow of information between different levels within the department. For the QCRI department, the structure is seen as flat, as the department is divided into five research groups who work collaboratively. It was indicated that "*there are a lot of cases where the scientist come up with ideas or come up with specific project that they want to do and we take it on. So at QCRI our structure is very flat. We don't have this hierarchy of top management. Everybody is almost on equal footing*" **(AIDR, SM)**. Therefore, this allows team members within the department to have flexibility in coming up with new projects (AIDR and Jalees) without being influenced by QF higher management, but all new projects, once approved at

departmental level, need to demonstrate how they align to the organisational vision and strategy. The Flat structure at QCRI also allows for a more flexible information sharing and flow between different members within the department, which allow for more innovation and creativity. In the PPE department, despite the department nature in taking managerial role through overseeing other research institutes (e.g. QCRI), the structure is mainly top-down. Although this dictates that majority of information flow (e.g. new projects) is driven from higher management, team members can come up with new ideas but they need to be aligned with the organisational vision and strategy, which is set by QF higher management, and this can restrict scope of projects. The FM department, although similar in nature to the structure of PPE department structure in being top-down, differs because of nature of the department in being a service department. The FM department's role is critical, as it oversees management of facilities across all departments within QF, hence, new ideas/projects have to be controlled by QF higher management to ensure good quality and effective customer service. Although nature of the department implies that team members do not have a degree of flexibility to propose new ideas/projects, it ensures that team members should adhere to policies, quality and professional service to other departments. The summary of these implications is given in Table 13

Table 13: Summary of the implications of departmental structure as a result of the organisational vision and strategy

	Qatar Computer Research Institute (QCRI)	Policy, Planning and Evaluation Department (PPE)	Facilities Management (FM)
Department Structure[3]	Flat structure New ideas/projects are mostly proposed by members of the department, and information flow between team members is flexible which allow for innovation and creativity.	Top-down structure New ideas/projects can be driven by team members or QF higher management. Information flow is top-down, which means if a new project is proposed by team members, it needs to align with the organisational vision and strategy, which restricts scope of the projects.	Top-down structure New ideas/projects are driven by QF higher management. Nature of the department dictates top-down information to ensure maintaining good quality and effective customer service by team members of the department.

(Source: the researcher)

5.4.2. Collaboration

The case analysis identified that collaboration is one of the core themes within each of the case studies, as it had an influence on members of the team. In the QCRI department, collaboration tends to be internally within QF, which can be with other research institutes, but also can be extended to external collaborations depending on nature of the project. For instance, in the case of AIDR, and due to nature of the project, external collaboration with humanitarian organisations was in place, which supported team members to work collectively towards project scope and ensure value of the project outcome once completed.

[3] These findings show that there is significant diversity in the structure of the departments across the QF owing to the wide range of projects. This diversity suggests that structure must be considered at a departmental level rather than at a firm level as suggested by the framework.

Similar to QCRI, collaboration in the PPE department also occurs at an internal level (within QF) and with other research institutes. This level of collaboration was seen a significant value adding, as some projects' impact and value, despite nature of the department in being the managing department for other research institutes, can be extended to other departments which was the case for PMS project. On the contrary, the external collaboration of the PPE department is limited and can be seen as a project dependent. According to one of the participants

"*Within QF I am not aware of internal networks, but there is procedure that you should follow to engage any other entity within the Qatar Foundation*" **(NIS, OS)**.

Reflecting on this, for instance, in the NIS project, there was an attempt to collaborate with SAP to work collectively as team members believed that such collaboration would support the project completion. This did not go ahead, which slowed the progression of the project that eventually stopped due to organisational restructuring.

The FM department, due to its nature being a service provider, maintains collaboration only at internal level. However, the collaboration, according to different members within the department is considerably limited, and this was seen as limiting in terms of improving service. According to one of the participants

"*if you want to achieve some innovation sometimes it's about the cross departmental relations and to put some functionality of the system which goes across departments like some integration*" **(CAFM, BA)**.

This for instance, was seen limiting the impact of service improvement, which was the case for CAFM project

"*The focal point approach when you are supposed to talk to one person who is representing some group of users or some other people this in particular I don't see as a supportive for the innovation process or a collaboration supportive*" **(CAFM, BA)**.

This impact of collaboration is summarised in Table 14

Table 14: Summary of the impact of nature of collaboration and networking across different departments

	Qatar Computer Research Institute (QCRI)	Policy, Planning and Evaluation Department (PPE)	Facilities Management (FM)
Collaboration[4]	Collaborations happen internally within QF with other institutes such as universities and happen outside the QF such as the case of AIDR were they collaborated with humanity organisations.	Collaborations happen internally within QF due to the fact that PPE monitor all the research institutes within QF. Their good collaboration helped smooth the implementation of PMS and to reach its impact and value. Collaboration outside of QF exists but is limited depending on the type of the project.	Collaborations only occur at an internal level; however, it is not as efficient as needed due to the mechanism used for communication between the departments which is the focal point.

(Source: the researcher)

[4] These findings show that collaboration is essential to achieving innovation. This adds to the conceptual framework where cross-functional teams were considered as an antecedent, as collaboration was seen internally with staff from the same background.

5.4.3. Culture and Knowledge Sharing

In terms of culture, it can be stated that a common culture across the QF as an organisation maintains openness and transparency, which seen as significant pillars to the success of QF as an organisation. From the case analysis, it was identified that there are some differences within each department in terms of working culture, which is influenced by nature of the department as well as the structure. At QCRI, the working culture supports idea exchange, and the fact that every member in the team is equal results in no hierarchical related complexities. This allows for a friendly and flexible working environment, which support motivating team members and facilitate a culture of innovation to come up with new ideas, which was the case for AIDR and Jalees. The working culture of the PPE department is similar to the QCRI, but with more formality as it occupies a managerial role, which operates directly under the QF higher management. Team members in PPE are perhaps encouraged to come up with ideas, but the flexibility is limited, as the departmental hierarchy is top-down, which requires a formal form of communication. Although this does not prevent team members from exchanging and communicating ideas, the process to approve new projects follows a more formal approach and requires them to be aligned with the vision and strategy set by QF higher management. In the FM department, due to the fact that it operates as a service department, the dynamics of working culture is perhaps influenced by the QF higher management. This means that communication and reporting take a more formal approach when compared to QCRI and PPE, because the daily operations require continual updating and reporting of issues. Hence, team members adhere to policies and procedures to demonstrate high level of professionalism and excellence in providing the service. This can be reasoned by nature of the projects such as VTS and CAFM where the innovation is on the process side to improve efficiency and effectivity.

Knowledge sharing was also recognised as an influencing factor on innovation project. It can be recognised that knowledge sharing has wider opportunities in the QCRI when compared with the PPE and FM departments. This is because, in the QCRI, knowledge sharing is affected by the culture they create and how they perceive innovation. Therefore, knowledge sharing is an essential activity that is expected from researchers in order develop new ideas and support each other in developing those ideas and sharing good practices within the field. In PPE, there are some similarities with QCRI in particular, sharing good practices. However, it does not necessarily aim at developing new ideas, but more on executing projects and that reflect the working culture within the department which is a mix of freedom and formality. At FM, and due to the nature of the department and the working culture, knowledge sharing is more focused on how to best execute operations that they deal with in order to solve problems that employees face. This can perhaps be reasoned by the culture in FM which is more operational oriented and very formal due to the structure, the constant need to follow QF's policies and procedures and the nature of the department in being service provider. Therefore, the role of knowledge sharing is important to innovation projects, as it goes beyond only generating/developing new ideas, to exchanging expertise, sharing good practices and also solving problems, as shown in Table 15

Table 15: Summary of the impact of nature of working culture and knowledge sharing of across different departments

	Qatar Computer Research Institute (QCRI)	Policy, Planning and Evaluation Department (PPE)	Facilities Management (FM)
Working Culture[5]	QCRI created a culture that	The culture is in PPE is supportive	The culture in FM is more

[5] These finding show that in large multi-sectoral NPOs such as QF, the culture of the department and it's working culture influence innovation projects rather than the organisational culture. That is because the working culture varied greatly across departments. This implies that the working culture must be considered at a departmental level rather than at a firm level as suggested by the conceptual framework.

	encourages innovation. Due to its nature and flat structure the working culture is very supportive in terms of facilitating the exchange of ideas between the groups members and in terms of helping each other in developing those ideas into prototypes. Teams are also able to communicate to their superiors without having to go through formalities which promotes the culture of innovation. This was the case in both AIDR and Jalees as these ideas came for the staff and were developed and approved by the management.	however the working culture is a mix of freedom and formality. It's supportive in terms of accepting ideas and having a friendly environment where people can talk to each other and discuss. However, it also has formalities to go through in order to communicate to the superiors. In addition, the process of approval is stricter due to the nature of the department and the role it plays within QF; some projects need the approval of QF higher management such as the PMS.	operational oriented and very formal due to the structure, the constant need to follow QF's policies and procedures and the nature of the department in being service provider. The working culture is more dynamic and the communication level between the teams and the management is very high. Reporting happens on a daily, weekly and monthly basis where the teams update the management on the operations and share issues and suggest solutions. This high formality sometimes causes delays.
Knowledge Sharing[6]	The way Researchers share knowledge is derived from the working culture developed within QCRI. Researchers meet as teams on regular basis and share ideas and	Employees meet together mainly to share and discuss their knowledge and the best practices in order to plan the execution of the approved projects.	The working culture within FM influence the way knowledge is shared within the department. Employees meet with each other and with their managers to share knowledge on how

[6] Based on the analysis, the extent of knowledge sharing was seen to be directly linked to and influenced by the working culture of the department/institute. It's significance towards innovation process and innovation projects is seen at a departmental level rather than at a project level as suggested by the conceptual framework.

	help each other to develop those ideas, also share best practices in their field to develop their knowledge.		to solve problems that they face in their daily operations while adhering to policies and procedures.

(Source: the researcher)

5.4.4. Resources and competencies

At a department level, resources and competencies were recognised as an important element, and based on the case analysis, a common challenge across different departments is resource acquisition. Within the QCRI department, despite being a research institute, funding is allocated for the department which then can be utilised for projects. For the AIDR project, due to the limited funding allocated for the project, team members could not request additional resources. This meant that they had to work under pressure to execute the project. Therefore, in the QCRI, competence forms a fundamental part, so that team members can cope with pressure when needed. In the PPE department, the impact of shortage in human resources was in terms of meeting deadlines. Due to nature of the PPE in being the managing institute for other research institutes, a delay in a project can affect these institutes, and perhaps the start of other projects within those institutes. Competency in the PPE department is seen essential, and it is the responsibility of the team members to seek training and improve their competency. This is crucial as nature of the projects, especially when it is imposed (e.g. NIS) by QF higher management, team members are expected to understand requirements and suggest process for execution.

Within the FM department, the human resources are generally sufficient, but due to organisational restructuring, they lost some of the specialists, which although did not affect

their daily operations, it impacted their level of service. According to one of the participants, it was highlighted

"*You need the tools to achieve your targets. Without them the quality, duration and/or desired outcome will be affected. We had to restructure, realign, reprioritize and review the whole objectives and KPIs*" **(CAFM, SM)**.

The shortage of human resource impacted the level of service provided such as service coverage, response time and request handling. Despite all these difficulties, team members in the FM department operate efficiently and effectively, and their level of competency is high because they exchange roles due to the nature of the department, as summarised in Table 16 and Figure 8.

Table 16: Summary of the way Resources and Competencies are perceived within different departments

	Qatar Computer Research Institute (QCRI)	Policy, Planning and Evaluation Department (PPE)	Facilities Management (FM)
Resources and Competencies[7]	For projects, resources are allocated based on the funding available within the department and the priority of the projects, and acquiring additional resources is complex, hence team members are often under pressure when executing projects. Team members' competency is high because of continuous knowledge exchange between team members.	For projects, team members have to deal with resource shortages, and this could impact meeting deadlines therefore they have to make more effort to avoid that. The level of competency is expected to be high as team members have to sign up for training and seek improving their competency.	For projects, and with the shortage of team members due to restructuring, team members manage to execute projects, but the service level was challenged. The teams' level of competency is high, as they exchange roles, and are required to do training.

(Source: the researcher)

Figure 8: Summary of departmental level impact on innovation

(Source: the researcher)

To sum up, the departmental level has supported understanding the impact on team members working across different projects. The structure at departmental level influences the initiation of project ideas. It was shown that with flat structures such as QCRI department,

[7] The resources were allocated to the projects by the department. Resources and competencies must be considered in tandem at a departmental level as the competencies (human resources) were essential to making best use of the constrained resources towards completing the projects.

ideas are mainly driven by team members, and this provides flexibility in terms of defining scope and direction of the project. In comparison, at the FM department, due to its nature in being a service department, ideas are driven by QF higher management. The PPE department maintains a balance between the structures seen in QCRI and FM, where ideas can be generated by QF higher management or team members. The impact, therefore, is on the nature of innovation within a department, which in the QCRI can be seen as open and flexible, at PPE is semi-structured and FM department is very structured. Although the variety of collaboration levels may not have a direct impact on team members themselves, it can influence workload and meeting deadlines. Similarly, working culture and knowledge sharing have varied between the three departments, and this has influenced the nature/flexibility of communication. In the QCRI, working culture maintains flexibility and team members are expected to learn and develop through communicating and sharing knowledge. In the PPE, team members are expected to seek personal developments, but in a more directed way than QCRI due to the nature of the department in being a managerial institute for other research institutes; their working culture maintains more formal approach due to different hierarchies. In the FM department, working culture is very dynamic and operational, as it is a service department, hence reporting and communicating occur at a highly formal approach, which imposes team members to maintain professionalism in their work; their knowledge sharing is a result of role exchange and training that they are required to do. Resources have also differed where in QCRI is based budget allocation, and PPE as well as FM departments are limited to the available resources. Competency across difference departments is high, but the approach in becoming competent have differed based on nature of the department.

5.5. Project Level

The project level, for the nature of this research, can support unveiling many of the complexities and perhaps intangibles that support informing the framework. Similar to the departmental level, the majority of sub-themes discuss project-related aspects with the exception of few (see Table 10).

5.5.1. Motivations to Innovation

As part of understanding the complex phenomenon within this research, it was important to understand different factors that supported motivating innovation within a project. It was found that the main factors that impact motivation to innovation are nature of the project, employee motivation and involvement of the management.

Nature of the Project

In the QCRI department, team members are always motivated to initiate new projects and ideas that support exposing research excellence and uniqueness of the department and QF as a whole. In the AIDR, for instance, the team was motivated to innovate because the anticipation was to develop a system that would serve humanity organisations thus has an international impact. Based on that, QCRI management considered AIDR as a priority project and allocated the necessary resources to it. As when looking at projects within the PPE department such as PMS and NIS, in terms of nature of the project, both were aimed to develop systems that would facilitate the management. However, PMS was proposed by the team members hence they needed to demonstrate the impact and alignment to the organisational vision and strategy whereas NIS was driven from QF higher management.

with internal impact and NIS with national impact. Based on the nature of the projects and the impact expected suitable resources were allocated to the projects and the team were

assigned. In the FM department, projects are mostly driven by QF higher management, and mainly focused on improving processes to provide better services.

Due to nature of the CAFM project and the fact that it was going to be implemented on a wider scale within QF suitable resources were allocated to the project and a cross functional team were formed to work on the system. The teams' understanding of the system and was an essential factor to ensure success of the project. This motivated team members to exchange different roles and responsibilities to enrich their knowledge about the system in every stage. Elaborating on that, and reflecting on the CAFM project, one of the technical staff stated

"*If you do the project and you don't have a mental framework to continue doing it, it won't last. So I think understanding every aspect of the system is very important on its own because everything is important*" **(CAFM, E1)**.

Hence, the team needed to formulate a framework that support managing the project, as the impact is often at an organisational level.

Employee Motivation

The findings showed an emergent theme that had a strong impact on innovation, namely the "Employee Motivation." Due to the flat structure within the department, teams have the flexibility to set their own mechanisms to work. Reflecting on AIDR and Jalees projects, the team has set workflows, milestones and communication mechanisms. Therefore, for both projects, the team maintained a collaborative environment to exchange knowledge and support each other, and this encouraged employee motivation to execute the projects. In addition, even when they faced challenges during execution, their motivation derived them towards achieving their goals. In the PPE department, one of the main motivations for

employees is creating impact within QF and on a national level through their projects. For instance, the deadlines for PMS project, were very tight and finishing the project on time was considered as a challenge for the team. However, their motivation to finish and implement the project and to create the impact they aimed for made them work very hard and overcome this challenge. For the NIS project, no timeframe was given hence the team had much freedom to embed innovation within the project and were motivated to escalate the project to a national level, hence a long time was spent on refining requirements. However, the project ended up placing on hold due to organisational restructuring. It can be said that within the PPE department, the team took a proactive approach, carefully considered communication mechanisms and maintained an organised manner when executing tasks. In the FM department, the nature of the department requires employees to cope with different service-related queries and issues that come from other departments. For the VTS project, employees indicated that, although the project was driven by QF higher management, employees were motivated to execute the project, as it supports improving their service delivery by having a centralised system which ultimately improve the services provided by the FM. For the CAFM project, employees' motivation was rationalised by their desire to implement the system across QF to facilitate their daily activities and improve the service they provide to the end users. This motivation was associated with the desire to provide the best service which in fact reflects the FM mission and vision. Hence, for both projects, the team used to meet for discussing operations, raise issues, propose new ideas, and exchange roles to improve skills and develop additional competencies.

Involvement of Management

For QCRI, although the QF top management do not directly get involved with the project beyond its approval, they appreciate different ideas and achievements, which act as a major

motivation to innovate in the ideas they propose. For instance, for the AIDR project, management engaged different stakeholders, and this supported exposing wider value whereas for the Jalees project, management was more focused on raising the right questions, and checking the alignment towards QF vision and strategy. For the PMS and NIS projects, the involvement of management was through workshops to monitor progress and ensuring alignment with the QF vision and strategy. According to one of the participants, it was stated

"*it is important for us and the higher management to monitor the progress of these projects to ensure that everything is going smoothly and as expected. We also join the staff in workshops not just to inform them of what we need, but to let them participate in developing the business plan*" **(NIS, SM)**.

For the FM department, the management involvement was recognised as one of the most crucial, which occurs at early stages of a project, to support understanding working mechanisms, communicating changes from management and/or when sensitive matters arise. For instance, one of the participants stated

"*Yes, once it is approved from our side there is no changes because once we change the process then you are going to change the whole system and the process is a very well defined so I can't change the process. For example, you are saying from your own preference I don't need this X person's approval from your own thought, but the policies and procedures say that once it is finished from you it has to go to x person*" **(CAFM, SM)**.

Indeed, within the CAFM project, management provided the support, directed the team at different times within the process and requested end-users' feedback on quality of the project as shown in Table 17 and Figure 9.

Table 17: Summary of the factors that motivated innovation for different projects

Project	Nature of the project [8]	Employee Motivation [9]	Involvement of Management [10]
AIDR	the project was to develop a system that would serve humanity organisations and have an international impact. Base on that resources were allocated to the projects and the team were expected to create international impact	Teams maintain collaborative atmosphere. They work, exchange knowledge and support each other, and this encouraged employee motivation to execute the projects even when they face challenges their motivation to drive them towards achieving their goals.	Appreciation from QF higher management and QCRI management. In addition, QCRI management get involved in supporting the engagement with external stakeholders
Jalees	The project was to develop a software product that would serve the educational sector. Therefore, suitable resources were allocated and the team were expected to commercialise a unique product		
PMS	The project was to develop a system that would facilitate the management within QF therefore suitable resources were allocated to the	The project's deadlines were very tight and finishing the project on time was considered as a challenge for the team. However, their motivation to	Involvement of management was through workshops to monitor progress and ensure alignment with the QF vision and strategy

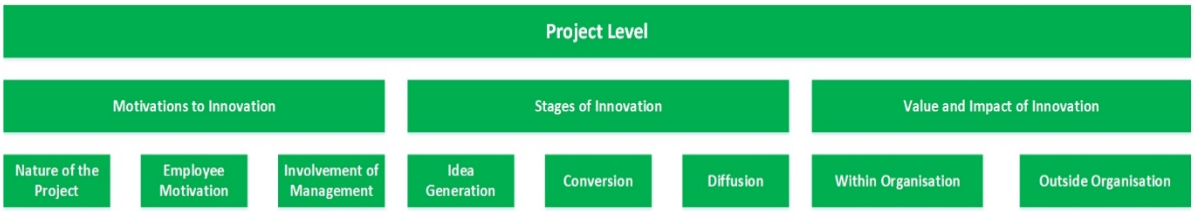
[8] The analysis shows the importance of the nature of the project as it influences the allocation of other resources and the level of innovation which was not included in the initial conceptual framework.
[9] Employee motivation was seen as an emergent theme that was not present in the initial conceptual framework.
[10] The degree of involvement of management was seen to be important as suggested by the initial conceptual framework.

	project and the team were expected to deliver a system that would create an internal impact and serve QF's vision and strategy	finish and implement the project and to create an impact within QF made them work very hard to accomplish what they aimed for.	
NIS	The project was to be implemented on the country level. Based on that QF allocated more resources and an external vendor was required to develop the system. The project team was focused on setting the requirements to execute the project.	Team was given freedom to come up with the suitable system specifications and in terms of time, so employees were motivated to innovate and come up with the system.	
VTS	The idea was proposed by QF's higher management and it was focused on process improvement for vehicle system. Based on that sufficient resources were allocated, and a vendor was selected to develop the system.	Employees were motivated to execute the project, as it supports improving their service delivery by having a centralised system.	Management was involved during critical decisions such as changing a requirement within the project, or providing feedback on the progress
CAFM	The idea proposed by QF's higher management to improve their daily process and their services across QF. to achieve that	For the CAFM project, employees were motivated to implement the system across QF to improve the service they	Management was highly involved. They provided the support, directed the team at different times within the process

	suitable resources were allocated to the project and a cross functional team were formed to work on the system. The team was focused on familiarising themselves with the CAFM system to deliver better services.	provide and to facilitate their daily activities. Their motivation was associated with their desire to provide the best service and this in fact reflects the FM mission and vision.	through meetings and requested end-users' feedback on the quality of the project.

(Source: the researcher)

Figure 9: Summary of project level impact on innovation.



(Source: the researcher)

5.6. Stages of Innovation

It is important to note that, in this context, the comparison between different projects will be contextualised within the context of idea generation, conversion and diffusion. This will support unravelling complexities, and more importantly, differentiate the impact of stages on innovation between different projects.

5.6.1. Idea Generation

For AIDR and Jalees, ideas were bottom-to-top (from employees), which means that they were proposed by teams within the department, and in most cases, ideas tend to be products. In such instance, ideas had to demonstrate alignment with the organisational

strategy, illustrate impact for QF, and in many instances, they need to demonstrate the wider impact. It was indicated by the team, for the AIDR project for instance, that they propose ideas based on the allocated budget within the department, hence requesting for additional resources after project start is complex, and the team needs to manage the project within the available resources. On the contrary, when Jalees project was proposed, the unawareness of long-term value in terms of commercialising the project resulted in it being unsuccessful. Thus, it is realised that in QCRI, it is important for ideas to be well-defined, and that the team proactively aware of the end product so that the project can be completed successfully within the available resources.

In PPE, projects can be bottom-to-up (from employees) such as PMS and they can Top-down (from QF higher management) such as NIS. The nature of ideas in PPE may not be focused on product innovation, but more of management innovation, as the department represents the managing institute for other research institutes. In cases where projects are bottom-to-top, projects require approvals from QF higher management, which was the case in PMS, as employees need to demonstrate improvements and impact on other research institutes. The NIS project was a top-down project, thus understanding requirements and how to execute the project was the primary focus for the team. Looking at the FM department, most (if not all) projects are top-down, and reflecting on VTS and CAFM, the innovation lies in process improvement. In such cases, the role of employees is to provide useful suggestions to make outcome the project effective and support improving the overall service despite nature of the department. In the FM department, the VTS and CAFM projects were rationalised by the need to improve processes to enhance service delivery.

5.6.2. Conversion

For the AIDR and Jalees projects, and due to the fact that ideas/projects are bottom up, working mechanisms were flexible, and they were decided by the team. Elaborating on this, one of the scientists indicated

"*Sometimes they are not convinced, but the still let you show then and prove the point. So there is freedom in that sense because mangers are not knowledgeable about everything. They don't know the details of every field*" **(AIDR, S)**.

Although it was highlighted that the team for the PMS project was given freedom in terms of working mechanisms, choosing the appropriate mechanism was the most challenging task. This can be reasoned by the available budget and the project requirements; hence the project was outsourced to a vendor where the progress was tracked through regular meetings. Due to the nature of the project, in addition, the strategic planning division which represented the higher management was involved in order to track progress and check alignment of the project to QF strategy and vision. In contrast, for the NIS project, employing a top-down approach, working mechanisms were dictated by understanding the requirements set by higher management, hence the team was expected to cope with this challenge, and had to share good practices to support execution, which also was the case for the PMS project. Reflecting on this, one of the participants stated

"*Our vice president had this idea, but he didn't specify what he wanted nor this was his job. But the people under him also had no clue, they knew this is what he wanted, but they didn't know what [was] in it*" **(NIS, SM)**.

Consequently, the team began by looking into existing models in order to understand the whole process and develop a prototype before outsourcing it to a vendor. In a similar case

to NIS, the VTS project's execution mechanism was proposed by the team but had to be approved by the management through a prototype before outsourcing to a vendor. More importantly, due to nature of the project, and its extent at an organisational level, control measures were in place to ensure delivery of the project on time. For the CAFM project, in addition to factors that influenced the execution process for VTS, available resources influenced the execution process. During project execution, although the FM department was in charge of most decisions related to the CAFM project, the higher management had to be informed, and more importantly, if the team proposed changes/suggestions (e.g. engaging end users in the execution process) to the process, it still had to go through a series of approvals. Therefore, it can be understood that project's nature and whether the project is top down or bottom up play the major role in influencing the working mechanisms. While most participants claimed that working mechanisms are often flexible and can be decided by teams in bottom to top projects such as AIDR, Jalees or PMS, in top-down projects, the working mechanisms are dictated by satisfying the project requirements, which in itself also impose another level of complexity. It was also noticed that where projects are limited in terms of budgeting such as NIS, VTS, outsourcing was the utilised approach, but the team had to illustrate key deadlines, understanding of the whole process and develop a testing prototype to detect issues. In projects where the impact is beyond the department itself such as VTS and CAFM, the higher management is over-involved where formality impact working mechanisms, as the main priority becomes completion of the project within the required time.

5.6.3. Diffusion

It is important to emphasise that not all the projects captured in this research have reached the stage of diffusion (implementation) where some were partially implemented. In the case

of AIDR, the project was implemented because it had well-defined scope and early engagement with appropriate stakeholders supported achieving wider impact. On the contrary, Jalees's deployment in the market was a major issue, and this was due to the constant change of product specification, and also lack of support from the higher management in seeking the appropriate entrepreneur. Hence, Jalees project is considered to be incomplete because it did not achieve its target. The PMS project, the team managed to cope with time pressure and successfully finished and implemented the project. The team was motivated to finish the project because it had an impact within QF. The project resulted in an innovative approach for the managers to manage projects across the different departments and institutes within QF. As for the NIS project, it did not reach the final implementation due to organisational restructuring and budget revision. As for the projects in the FM department, the CAFM was implemented across FQ's different facilities and the system helped the FM to enhance their services and operations. Despite the challenges the CAFM team faced after reducing the staff number, they still managed to run the system and provide their service across QF. On the contrary, the VTS project was not implemented, due to the decision of restricting and placing the smart project on hold which lead to placing VTS on hold as well. Although, it went through pilot testing and the team was ready to start its deployment so that it provides a more effective and efficient process to manage vehicles within QF, they decided to put the project on hold as summarised in Table 18

Table 18: Summary of impact of stages of innovation on different projects

Project	Idea Generation [11]	Conversion [12]	Diffusion [13]
AIDR	Bottom-top and product-based innovation, which motivated the team to achieve impact.	Flexible working mechanisms decided by the team members. It provided the opportunity to share good practices.	Implemented because of well-defined scope and early engagement of relevant stakeholders
Jalees	Bottom-top and product-based innovation, which had the focus to be commercialised		Not implemented because of continous change of specification and inability to commercialise the product
PMS	Bottom-top and management-based innovation to act a centralised system for research projects across QF	Working mechanisms were decided by the team, but had to be approved by QF higher management to ensure keeping the project under budegt	Implemented and had an impact on other research institutes and inteties within QF
NIS	Top-down and management-based innovation, which had huge potential to become a national database for research projects	Working mechanisms were dictated by QF higher management, but no timeframe was allocated to execute the project, hence the team was expected to innovate when executing the project	Not implemented because of the restructuring.
VTS	Top-down and process-based innovation, which aimed to improve efficiency and	Working mechanisms were proposed by the team but had to be approved by QF	Was not Implemented because due to restructuring.

[11] These findings agree with the stages of innovation described in the conceptual framework. The idea generation is influenced by the nature of the department (top-down or bottom-up) as well as the type of innovation considered.

[12] These findings also agree with the conversion stage from the stages of innovation described in the conceptual framework. They show that flexible working mechanisms are crucial in fostering an innovation-centred work environment. This may be hard to achieve in large NPOs.

[13] The analysis shows that the findings agree with the diffusion stage from the stages of innovation described in the conceptual framework. They show that continually changing project resources (such as time and budget) can be detrimental to the execution of the project.

	effectivity of managging vehicles in QF	higher management, so the communication maintained formality and team has outsourced the project to execute it within the time-frame allocated	
CAFM	Top-down and process based innovation, which aimed to improve service quality for operation and maintenance in QF	Working mechanisms were dictated by QF higher management, so the team was expected to deliver within tight deadlines	Was implemented across different facilities within QF.

(Source: the researcher)

5.7. Innovation Performance

5.7.1. Impact, Value and evaluation of Innovation

Due to the difference in nature in terms of innovation projects investigated within this research, the impact and value have varied. In fact, the impact and value can perhaps be recognised more significant for projects that were completed. For instance, in the case of AIDR project, its impact was illustrated through being a decision-making system for social impact in humanity organisations where the project won a number of awards, managed to get publications, hence the impact and value were seen at an international level. Nevertheless, Jalees's inability to be commercialised could not support realising its impact and value when compared with AIDR. Therefore, the metrics with which such projects were evaluated on included tracking KPIs, timely progress and commercialisation. When looking projects within PPE, the PMS project was considered as a success, as it resulted in new business practices, an innovative approach in managing projects and a measurable approach to the success of research projects across QF. However, for the NIS project,

although seen as an opportunity in improving collaboration and improve decision-making, it lacked vision, which delayed its start due to the lengthy process of approvals by higher management and later it was put on hold due to restructuring, hence it was not implemented. For the VTS and CAFM projects, the main value was seen in terms of presenting a new method for organising work responsibilities. It can be argued that for impact, value and evaluation, the expectations from bottom-up projects were more, as the higher management's interference was less when compared with other projects. For bottom to top projects that planned impact and value to be within QF such as PMS, the lengthy process of approvals can be seen as a hinder for projects to go forward. In contrast, for top-down projects, the impact and value can be limited to 'process change', which does not necessarily incorporate innovation, but supports more-efficient mechanisms. Evaluation of top-down projects was more objective, and perhaps organisational based. For instance, the PPE and FM departments, a projects' evaluation was based on KPIs, and achievement of project objectives, but for VTS and CAFM projects in particular, feedback from end users was also used as an indicator. Table 21 presents a summary of impact and value of innovation for different projects.

Table 21: Summary Value and Impact of Innovation across different projects

Project	Impact and Value [14]
AIDR	Social Impact – won a number of awards, managed to get publications hence the impact and value were seen at an international level
Jalees	Lacked impact because the product was not commercialised
PMS	Management Impact – resulted in new business practice, provided a measurable approach to success of research projects across QF
NIS	Opportunity to improve collaboration, but lacked impact
VTS	Opportunity to provide more effective and efficient method to organise the management of vehicles within QF, but incomplete due to restructuring.

[14] An emergent theme from these findings is that large NPOs like the QF focus on the impact and value of the project rather than the objective measures such as the financial returns.

CAFM	Process Impact – resulted in new business practice that provided more effective and efficient operational process that replaced exiting processes within the FM.

(Source: the researcher)

5.8. Conclusion

To sum up, this chapter aimed to provide cross-case analysis through the six case studies analysed in Chapter 4. The analysis was done at organisational, departmental and project levels in order to draw a more-holistic approach towards understanding different complexities faced within different projects. Tables were used to point out the differences, which were between either departments or projects. At each of the indicated levels, a diagram that presents a summary of the impact on innovation was presented (Figures 8, 9 and 10).

Based on different levels, it can be stated that impact on innovation has varied, and this was dependent on nature of the project and nature of the department. Nature of the project can be seen as the most dominating factor especially when projects are from bottom-to-top. For instance, in QCRI, most (if not all) projects such as AIDR and Jalees are bottom-to-top, hence the project level factors (e.g. motivation to innovation, stages of innovation and value and impact of innovation) will the most influential for the project, which will follow by organisational level to get approvals then departmental level for execution. On the contrary, in the FM department where projects are mostly top-down such as VTS and CAFM, the most dominating factor is the nature of the department. This is because the department operates directly under the QF higher management, and departmental factors (e.g. collaboration and working culture) within the department will be impacting the projects, which then follows by organisational level for management and finally the project level. As for the PPE department, nature of the project and nature of the department will be equally dominating whether the

project is bottom-to-top or top-down. This is because of the role the department occupies in being the managing institutes for other research departments, which although gives the freedom for their employees to propose projects, the nature for these projects have to be aligned with nature of the department.

Based on the above, it can be perceived that the nature of innovation within non-profit organisations is complex, and particularly in large organisations such as QF where there are many departments that vary in nature. The next chapter discusses the implications of analysis from this chapter and suggests amendments on the framework proposed earlier in chapter 2.

Chapter 6: Discussion and Practical Implications

6.1. Introduction

This chapter discusses the analysis presented in Chapter 5, highlighting the implications on the framework developed in Chapter 2. The previous chapter provided cross-case analysis, which provided rich insight into innovation at organisational, departmental and project levels. This reflected part of the complexity related to innovation projects in organisations and showed the impact of on different projects investigated in this thesis.

6.2. Antecedents of Innovation

To begin with, while referring back to the conceptual framework proposed in chapter 2, antecedents of innovation included firm and project-related considerations. This was rationalised by numerous studies (Martinez-Roz and Orfila-Sintes, 2009; Tawiah and Russell, 2008; Panne et al., 2003) that highlighted drivers and hindrance factors to innovation. However, following the cross-case analysis, antecedents of innovation were distinguished on organisational and departmental levels.

6.2.1. Organisational Antecedents

6.2.1.1. Organisational Vision and Strategy

The various studies in literature (such as Herrera, 2016; Donate and Guadamillas, 2011) showed that the successful adoption and implementation of innovation is influenced by having a clear direction, vision and strategy. From the cross-case analysis, it was identified that organisational vision and strategy has a direct impact on the project (e.g. NIS, VTS and CAFM), where this impact is recognised through departments in terms of their vision and

strategy. Thus, in addition to agreeing with the literature used to form the conceptual framework, the cross-case analysis further showed that, in large NPOs such as the QF, the impact of vision and strategy differs across each of the departments. This happens due to the diverse range of projects embarked on by each of the respective departments that work towards different social objectives. For instance, in the QCRI, although the vision and strategy are both impacted by the general vision and strategy set by the QF, the department set their own vision and strategy when compared with other departments (PPE and FM) which had their vision and strategy set by QF directly. Consequently, and although the analysis complimented the majority of studies in the literature, the analysis revealed that organisational vision and strategy can influence innovation direction/scope where in QCRI innovation scope is not limited when compared to PPE whose innovation has to be aligned with the department's vision and strategy or FM department where innovation is mostly driven by top management.

6.2.1.2. Governance and Policies

Existing studies showed that managerial variables (Edwards-Schachter et al., 2015; Koberg et al., 2003) play an important factor in impacting innovation. Although in many of these studies, managerial variables may encompass governance and policies as part of the consideration, the findings of this study show that governance and policies are pivotal antecedents to innovation in the NPO context and must thus be isolated as a distinct antecedent of innovation. Using the cross-case analysis, it was identified that the governance and policies within the QF had an impact on projects in terms of human resource acquiring, budget cuts and restructuring. This was perhaps reasoned by the rigidness and inflexibility of policies in place, which impacted resource acquiring and processes. This theme was not identified in the conceptual framework but rather emerged from the findings;

it was seen to have a significant impact on the ability of a department to innovate. This was shown in the analysis where, in QCRI's projects, QF's governance and policies posed a major challenge in terms of resource acquiring, and in one of the projects (Jalees) influenced its progression to the market. In other departments, the impact was strongly recognised in terms of decision-making, which was mostly done by higher management. This can be reasoned by the fact that, in non-profit organisations, governance and policies tend to set rigid processes to ensure that departments conform to them, which can explain why, for instance, human resource acquiring was recognised as an issue. Due to the high number of departments within QF, budget cuts and restructuring can take place, and this illustrates that in non-profit organisations, priorities occupy a major role, which means that the organisation can focus on sectors or directions that support sustainable value in the long-term.

6.2.2. Departmental Antecedents

6.2.2.1. Department Structure

The impact of structure within organisations was recognised by many studies (including Chen and Chang, 2012; Daugherty et al., 2011) as one of the antecedents that impact innovation. The cross-case analysis showed that the findings agreed with this idea. However, they go further by showing the importance of considering the structure of each department independently, because large NPOs like the QF simultaneously work on a large range of projects through the different departments. Consequently, the structure of each department can differ significantly. The cross-case analysis shows that distinguishing between organisational and departmental antecedents is crucial, as this supports acknowledging potential complexities, provides a richer understanding and reveals implications on innovation projects. However, in the case of QF, the impact is dictated by nature of the department and what drives its structure. The cross-case analysis indeed

showed that structure impacts nature of innovation within the department. For instance, when looking at flat structure department such as QCRI department, it was indicated that new ideas/projects are proposed by the member of the department, which provides flexibility for teams to propose ideas. As for PPE and FM, which had a top-down structure, most of the ideas are often driven by QF higher management, which means that scope of projects is often restricted. Although the PPE department, compared to FM department, still allow teams to propose ideas (e.g. PMS), they need to be aligned to the department's vision and strategy. Consequently, when comparing for-profit with non-profit organisations, it can be realised that the structure in non-profit organisations can play a major role especially if the organisation is large such as the case in QF, and impact scope and nature of innovation.

6.2.2.2. Collaboration

The conceptual framework shown earlier presented cross-functional teams as being an important antecedent of innovation, whereby cross-functional teams refer to a group of individuals (both internal and external to the company) with differing backgrounds and areas of expertise work towards a common goal (from studies including e.g. Cotterman et al., 2009; Basadur and Gelade, 2006). Moreover, one of the innovation definitions (Mention, 2011) intertwined that innovation is resulted from collaboration between actors within and outside a firm. The cross-case analysis revealed that cross-functional teams were indeed important for achieving innovation in many of the projects. However, in addition to using cross-functional teams, many projects effectively made use of internal collaboration with employees from similar backgrounds. This also agrees with previous studies (including Ko et al., 2011; Zhou et al., 2013) that both discuss collaboration in its general sense as a means of achieving innovation by using different actors/teams. The cross-case analysis extended this to show that collaboration (whether at departmental or cross-departmental

levels) is a driving mechanism and can indeed impact the initiation of innovation. Thus, it is recognised that collaboration is influenced by nature of the department, and this perhaps allows or restricts collaboration beyond the department to other departments or even outside the organisation. It can be stated that differences between the departments in terms of collaboration can be reasoned by size of the QF as an organisation, taking into account that there is a high degree of diversification and backgrounds included, which results in differences across different departments. For instance, in CAFM project, although a task force team of different teams (e.g., maintenance, IT and operations), it was indicated that collaboration with other entities/departments was essential to improve services. In AIDR and Jalees, collaborating with external partners was essential to ensure exposing a more impactful value of the project.

6.2.2.3. Working Culture and Knowledge Sharing

According to many studies in the literature (e.g., Herrera, 2016; Hogan and Coote, 2014), the culture and values in an organisation impact the strategies that affect the level of innovation. The findings showed that the departments and institutions are likely to have independent cultures due to the different sectors that they operate in and their needs. Hence the culture developed within these departments/institutes have a significant impact on the processes followed within these departments and the innovation performance rather than the overall organisational culture. Through the cross-case analysis, it was found that although the culture across QF maintains openness and transparency, which promotes innovation at an organisational level, certain aspects differed based on nature of the department; the analysis shows that the culture that is embedded in each department forms the way they share knowledge and conduct their daily activities. Due to the diverse range of projects, the culture differs between departments and must thus be considered at a

departmental level. For instance, in the PPE and FM departments, the nature of the department dictates more formality, hence the working culture tends to be influenced by hierarchies. The PPE department, on the other hand, compared to the FM department, has more flexibility in terms of communicating with each other and exchanging ideas, which is reasoned by the fact that they are still predominantly a research institute along with their managerial role of other research institutes. Thus, although literature has acknowledged the impact of culture within an organisation on innovation, the analysis from this research revealed that culture can perhaps be influenced by the nature of work/operations within a department. This can ultimately influence the extent and quality of knowledge sharing between team members. For instance, in the FM department, nature of work is heavily dependent on service level, hence innovation would mostly be aligned with improving processes when compared to QCRI department where innovation relies on demonstrating impact for a wider audience, hence the scope of new projects is mostly defined by employees. As for QCRI, working culture was perceived as the most flexible compared to PPE and FM departments, as it promotes exchanging ideas, and continually seek excellence in and outside QF.

6.2.2.4. Resources and Competencies

Studies such as Lee et al. (2001), Brook and Pagnanelli (2014), Salerno et al. (2015) and Camelo-Ordaz, et al. (2015) that were used to form the conceptual framework found that having adequate resources (both tangible and intangible) and competencies (the human resources such as the skills and capabilities) is essential towards completing a project innovatively. The cross-case analysis showed that the resources are allocated to projects by the department overlooking the project. Resources and competencies were indeed seen as a critical antecedent that impacted innovation projects at a departmental level. They are

considered in tandem as some projects, such as the PMS, overcame tight constraints on resources using a highly skilled workforce. In the case of AIDR and Jalees, both projects required specialist skill that was not available within the team, whereas in NIS project, the team had to adjust project requirements to suit the available resources. From another perspective, for some projects that are driven from higher management, it was highlighted that innovation project ideas are likely to be abstract, and accountancy of potential complexities only becomes possible when the team identify requirements. Commonly, across most projects, team members were expected to cope with pressures and tight deadlines. The main difference between departments is the rationale for employee motivation. In QCRI department, employees were motivated to execute projects so that they can demonstrate and achieve national as well as international recognition, which was illustrated in the case of AIDR for instance. As for PPE department, in addition to the fact that QF higher management are influencing most innovation projects, employees' motivation is rationalised by the fact that most projects have a direct impact on other research institutes, hence completing a project is considerably significant. As for FM, and despite the fact that it is a service department, employees are motivated so that they can improve both existing processes and service quality.

6.2.3. Project-related antecedents

6.2.3.1. Nature of the Project and Employee Motivation

According to Anderson et al. (2014), innovation and creativity are directly spurred by time availability, and additionally, imposing pressure on employees can impact innovation (Hsu and Fan, 2010; Ohly and Fritz, 2010). Although many studies (e.g. Bessant and Tidd, 2007; Trott, 2012; Keeley et al., 2013) have elaborated on different types of innovation, they did not acknowledge potential challenges that can be associated with having employee-driven

or management-driven projects. Some scholars (e.g. Shane, 2003; De Jong and Marsili, 2014) have elaborated on motivations within NPOs, and how they differ compared to for-profit organisations, which take more entrepreneurial approach with profit-focused perspective. The cross-case analysis agrees with this and revealed that there are three motivations to innovation: the nature of the project, employee motivation and involvement of management. In terms of nature of the project, according to studies in the literature (e.g., Bessant and Tidd, 2007; Damanpour et al., 2009; Rowley et al., 2011), different types of innovation require different approaches and support as each type of innovation has different characteristics. The findings agreed with that and showed that the nature of the projects dictate the resources and the set of skills and expertise that should be allocated to each project in order for it to be executed and implemented. The findings further showed that the nature of the projects is linked with the intention of the innovation, and nature of the department. Through the analysis, it was found that the emphasis was placed on the intention behind initiating those projects and what impact and value the employees wanted to create. In essence, this means that the type/nature of innovation is highly influenced by intention and identifying the need to initiate a project. For instance, and reflecting on analysis from cross-case analysis, projects from QCRI were product-based innovation such as AIDR. The team's intention was to create impact internationally by helping humanity organisations over the world. Hence, the intention behind the project played a major role in dictating its nature which influenced the management decisions in terms of prioritising the project and allocating resources to it. In FM department, the nature of the department resulted in great emphasis on improving their processes. Therefore, the CAFM was initiated to improve their process which will enable them to provide a better service across QF. Consequently, the nature of the CAFM project dictated allocating more resources to it and creating a cross-

functional team to work on executing and implementing the project across the organisation. Thus, although literature has acknowledged the differences between the different types of innovation, the analysis from this research revealed that the nature of the projects has a significant impact on the management decisions and strategies regarding resource allocation. This means that in the NPO context, the nature of the project must thus be isolated as a distinct antecedent of innovation.

In term of employees' motivation, some studies in the literature (e.g., Cotterman et al., 2009) argued that having a rewarding system can sustain the recognition and motivation for innovation, creativity and novelty. However, they didn't acknowledge the motivation that is driven by the employees' desire to create social impact and value. This study showed that in the context of NPO, employees are self-motivated, and part of their motivation is linked to their desire to make a change and make an impact internally and externally. From the cross-case analysis it was found that employees motivation formed a core part of innovation and has a significant impact on initiating, executing and implementing innovation projects and on innovation performance. For instance, in PPE department employees were motivated to create an impact within the organisation by developing the PMS. Therefore, although they were pressured with tight deadlines and limited staff, they dedicated themselves to implement the project successfully. Their desire in making change within QF derived them to innovate and lead the project to success. Also, in QCRI, AIDR's team were very self-motivated and this was reasoned by their desire and passion to create social impact and help those people who are in need. Their motivation derived them to dedicate their efforts to implement AIDR and keep assisting humanity organisation although they were working with limited staff. So, employees' motivation is as important as their skills and expertise because their motivation will help in overcoming the challenges they face. Hence, based on

this study it can be said that in the context of NPOs employees' motivation has significant impact on innovation and thus should be considered as a vital antecedent of innovation.

6.3. Stages of innovation

This section elaborates on stages of innovation proposed in Chapter 2, namely: idea generation, conversion and diffusion. This abstraction of stages of innovation was acknowledged by Hansen and Birkinshaw (2007). The article discussed that idea generation can be as result of internal, external or cross pollination; conversion is controlled by selection (screening and initial funding) and development (movement from idea to first result) and diffusion is perceived through dissemination across the organisation. However, through analysis of the case studies, this abstraction has indeed changed. This will be discussed along with the supporting literature.

6.3.1. Idea generation

Existing studies highlighted that, in small and large firms, having supportive and developing culture supports fostering creativity and innovative ideas (Hamel, 1999). In fact, the literature identified that segregation (Osborn 1963), structure (Rickards and Freedman, 1978) and strategic intent (Amabile, 1998) are factors that influence idea generation. Other studies, in addition, showed that internal and external relations (Hansen and Birkinshaw, 2007), and particularly cross-collaboration, are one of the drivers for idea generation. This was indeed confirmed and highlighted as one of the areas for improvement in the CAFM project, where participants indicated that engaging with end-users could potentially boost innovation. Participants from NIS and PMS projects also indicated that cross-collaboration could support more-focused innovation and avoid duplicating efforts in other projects. From another perspective, nature of the department influence idea generation where in flat structure (e.g.

QCRI department), the likelihood of generating new ideas is higher when compared with FM department, for instance. Beside nature of the department, in QCRI, the interaction between teams and employees, especially at an informal level, was seen as a stimulator for sharing and exchanging new ideas when compared with the FM department where interactions often maintain formality, and report on issues. In the PPE department, the nature is slightly different where this is reasoned by the department being a research institute and also coordinating other research institutes. Hence, idea generation in such department can be very similar to QCRI, but maintains more formality, which is similar to the FM department. Therefore, based on the above, it can be stated that 'collaboration' impact idea generation can be at an internal level, cross departmental level or external level.

In addition to collaboration, project scope was also identified as one of the factors that influence idea generation where this was identified through the analysis. In fact, project scope, in the case of the QF case studies, showed that the impact of project scope is significant across all stages within stages of innovation. Project scope, in the context of this thesis, refers to whether the project was driven from bottom to top or top-down. Across the QF, as an organisation, it was highlighted that employees and teams are continually encouraged to initiate and propose ideas to demonstrate excellence, but they always must align to the vision and strategy at a department level and organisational level. In the case of bottom to top projects, it was identified that although innovation is embedded, project scope needs to pass multiple stages for approval where this differed based on nature of the department. In the case of new ideas (e.g. AIDR and Jalees), project scope needed to align with QF's vision and strategy, develop a clear business plan and be able to demonstrate impact. More importantly, project scope can influence the project at later stages, for instance, in Jalees, commercialising the product was important to demonstrate impact, but

the team did not have marketing expertise, hence this affected the deployment of Jalees. In Top-down projects, projects are driven by management, hence they do not face most complexities that bottom-up projects face, as the scope is pre-defined by management. The main downside, however, in some cases (e.g. NIS), is identifying project requirements that rely on teams/employees where the attention is often driven towards satisfying project scope with minimal attention to innovation. It is important to note that new ideas often are bottom to top, whereas top-down projects are more focused on improving existing processes and operations. This can perhaps be reasoned by nature of the department, and the driving mechanisms (will be explained in conversion) that control operations within the department.

6.3.2. Conversion

Existing studies such as Hansen and Birkenshaw (2007), recognised the inevitable role that conversion occupies in a project, as it reflects a significant part of the success in an innovation project. Based on literature, conversion is a multifaceted concept where it can be perceived as the processes used to convert new ideas into innovation, or it can also be seen as the selection process of ideas that can be used for development (reaching the initial results) when executing a project. Although Hansen's and Birkenshaw's (2007) abstraction of conversion in terms of selection and development reveal the important aspects of conversion, which the analysis of this study confirmed, the analysis revealed further complexities. Through the case studies, conversion was perhaps recognised as one of the critical tasks that impact innovation. One of the first aspects found is working mechanisms in a project. Similar to the impact of project scope, conversion differed based on whether a project is bottom up or top down, and also based on the departmental ethos. In the case of AIDR and Jalees projects, working mechanisms were flexible where this allowed sharing good practice and developing each other to best execute the projects. Although PMS project

was also bottom to top, limited budget and project requirements influenced choosing the appropriate mechanism to execute the project. This was due to the need to execute the project without getting further resources. Conversely in the case of CAFM, VTS and NIS, although working mechanisms are often chosen by the team, they cannot proceed without the management's approval, and more importantly, they need to adhere to the strictness of policies and procedures within their respective department. Thus, it can be stated that working mechanisms on whether they are flexible or restricted can influence the progression of innovation projects during the conversion phase. Another aspect that influenced conversion was knowledge sharing, which similarly was affected by the department's nature.

The cross-case analysis highlighted that mechanisms within the department play the main role in influencing knowledge sharing, which ultimately will influence projects within that department. In the QCRI and PPE departments, knowledge sharing was seen essential to share good practices, but nature these two departments imposed some differences. In other words, whilst sharing good practices is seen as a rationale within QCRI and PPE to share knowledge, in QCRI, knowledge sharing was also seen as a great venue to develop knowledge and exchange ideas. These further potentials might be restricted in PPE due to nature of the department, which also occupies a corporate role by managing and coordinating other research institutes. On the other hand, within the FM department, knowledge is primarily based on daily operations that ensure the continuation and functionality of the department, hence this was also the case for both CAFM and VTS projects. More importantly, and despite the FM department being a service provider, the attention towards adhering to policies and procedures becomes the main priority and knowledge building is primarily based on training.

Based on the above, it can be stated that innovation, as a result of knowledge sharing, can be influenced and the major impact occurs during the conversion stages. Knowledge sharing in fact occupies an important role in initiating new ideas, and this was stressed by OECD (2005) which highlighted the need for institutions to observe processes/mechanisms that allow knowledge creation, diffusion and even application. Although the impact of knowledge sharing can be recognised across all stages of innovation, its impact during conversion is more significant, and supports capturing innovation-enablers regardless of nature of the project.

6.3.3. Diffusion

The final stage of innovation to be discussed is diffusion, which is concerned with dissemination and deployment of ideas/projects within and outside an organisation. According to Cooper and Klienchmidt (1990), diffusion is highly impacted by conversion, but more importantly, depends on the overall thinking process about intention of the idea/project. In addition, a recent study by Deichmann et al. (2020) showed that characteristics of the idea/project and its connectivity to the content network (internal, external or both) can influence the success of idea diffusion. The cross case analysis agrees with this and showed that the considerations towards diffusing a project differed. In the case of AIDR, the diffusion was aimed to be at an international level (external level), hence external networks were integrated as part of the conversion process, and this enabled successful diffusion. However, in the case of Jalees, the diffusion's extent required commercialising the product, which was not originally supported through idea generation or during conversion, which affected the overall diffusion. Other projects such as VTS was partially diffused, which was through prototyping and pilot testing, as the diffusion was targeted to be internal (within QF). In the NIS project, although the initial intent was to diffuse the project internally, at later stage

during conversion, it was recognised that diffusion could also be extended to be external, but the project was not implemented due to organisational restructuring.

6.4. Innovation Performance

6.4.1. Impact, Value and Evaluation

The literature identified that, on the one hand, innovation performance can take an objective metrics such as products and services introduced (Romjin and Albu, 2002; Chen and Muller, 2010), but the most common metrics used, especially for new products are profit, sales, market value and growth rate (Mankin 2007). On the other hand, assessing innovation impact can also take a subjective approach, which takes different approach than looking at innovation as a product or sales, to look at the innovation from a process (Chen and Muller, 2010) and comparison (Alegre, 2009) points of view. The literature highlighted that the multivariate phenomenon of innovation can perhaps lead to multi-methods in perceiving its value and evaluating its impact (Manoochehri, 2010). Based on the cross-case analysis, the evaluation of innovation can be seen as an emergent phenomenon resulting from the increased focus placed on the social value and impact by NPOs rather than on the objective measures seen in conventional organisations. Specifically, the findings showed that the assessment of the projects depended on the impact and value that they aimed to achieve through the project. The main desire of large NPOs is to create impact and value that is both internal and external to the organisation and host country. The way projects have demonstrated impact and value across QF have indeed differed, but key performance indicators (KPIs) were seen as the common evaluation used at an organisational level for all projects across different entities/departments. In fact, and looking at projects that were

diffused, the impact varied, which depended on intention of the project. For instance, the AIDR project resulted in a decision-making system that can be deployed by humanity organisations, won a number of awards, hence the impact is at an international level. The PMS project was implemented and resulted in a new business practice, an innovative approach to managing projects and proposed a measurable approach to success of projects across QF. Nevertheless, although some projects were diffused, their impact could not be measured, which was the case for Jalees project, as inability to commercialise it hindered the impact and value. This is applicable for the CAFM project, for instance, where feedback of the users can be used as an indicator for success and impact of the project. Consequently, the complexity of innovation, however, does not lie in evaluating innovation or understanding its impact and value, but more importantly, in the approach towards understanding innovation. These emergent themes from the study are captured in the final framework presented in Figure 10

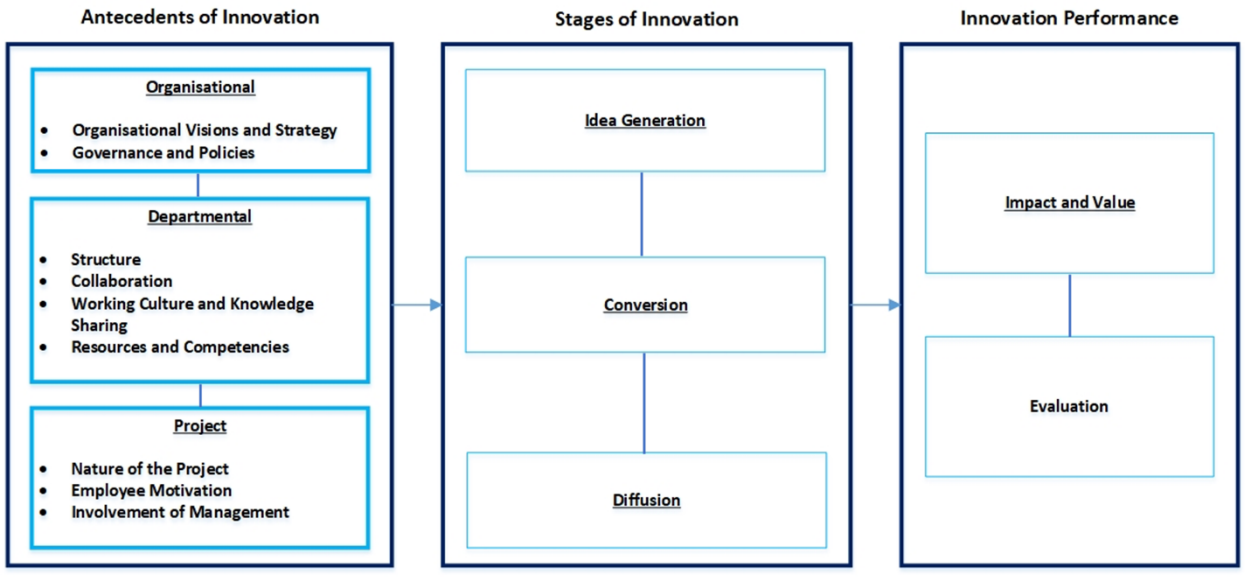


Figure 10: Revised Conceptual framework

(Source: based on the findings of this research)

The final framework categorises the antecedents of innovation as being organisational-level, departmental-level and project-level to describe the scope of the respective antecedent when considering large, multi-sectoral NPOs like the QF that operate on a large range of projects. The Organisational antecedents comprise of the Organisational Vision and Strategy and the Governance and Policies (an emergent antecedent). The Organisational Vision and Strategy is an important antecedent of innovation as it is crucial for a large NPO like to QF to have a clear vision and strategy to help guide the execution of the various projects undertaken. The Governance and Policies emerged from the study, as it was found that having a rigid policy base across the organisation can hinder the tendency to complete projects innovatively.

The Departmental antecedents comprise of Structure, Collaboration, Working Culture and Knowledge Sharing and the Resources and Competencies. The cross-case analysis revealed that these antecedents must be analysed at a departmental level rather than at a firm level as suggested by the earlier framework due to the relative diversity and autonomy with which departments operate in large multi-sectoral NPOs like the QF. Specifically, the Structure refers to the hierarchal arrangement within the department that can either be flat, top-down or bottom-up. Collaboration (rather than Cross-Functional Teams as identified in the earlier framework) is an important antecedent for innovation as a collective effort between internal and external employees from both similar and different backgrounds was seen to be essential towards completing the project. Similarly, the Working Culture and Knowledge sharing describes the general working environment and culture prevalent in the department (formal or informal). This working culture is considered in tandem with the sharing of knowledge as the findings showed that the culture directly affected the sharing of knowledge and the operation of the department as a whole. Moreover, the findings revealed

that the Resources and Competencies encompass the tangible and intangible resources that the department can allocate towards a project along with the human resources (such as skills and knowledge) that can use these resources to complete the project.

The project level antecedents include the Nature of the Project (an emergent theme), Employee Motivation (an emergent theme) and the Involvement of Management. They are considered at a project level as there is an element of diversity of the projects carried out by the department itself. The Nature of the Project has a significant impact on the allocation of resources and on the level of innovation as it helps ascertain the importance of the project for the foundation which ultimately defines the level of innovation expected. Employee Motivation was seen to be crucial from the findings of the study as many employees felt that innovation can be encouraged by having a highly motivated group of employees towards the ultimate goal of the project. The Involvement of Management was also seen to be important as having a long managerial approval process or a strong involvement of higher management was seen to reduce the level of innovation as it slowed down the rate of information flow with many managers not fully understanding the technical details of the project.

The stages of innovation were unchanged from the previous conceptual framework as they complemented the earlier studies and is made up of Idea Generation, Conversion (the selection process of ideas that can be used for development when executing a project) and Diffusion (dissemination and deployment of ideas/projects within and outside an organisation). This innovation process was seen in the findings where ideas were generated (either by management or employees), refined using the conversion stage and finally deployed using the diffusion stage.

The success of an innovative project can be assessed through the Evaluation of its Impact and Value, which can be subjective or objective measures of the level of success that the project has achieved towards its intended goal. The Impact and Value was not in the initial framework as the findings show that organisations such as the QF prioritise the impact and value of the project as an outcome over its financial returns. Consequently, the way that they evaluate the performance of these projects is dictated by the impact and value that they want to achieve with the project.

6.5. Conclusion

The goal of this study is to identify the key antecedents of innovation for NPOs using the Qatar Foundation as the basis. The findings show that the identified antecedents in the conceptual framework are key to innovation and they have varying influences on innovation processes and performance. While focusing on product innovation (using the Jalees and AIDR case studies), they show the extent to which higher-level governance within the QF can hinder innovation. Although the policies and procedures set within the department are designed to promote creativity and collaboration, their efficacy is hindered by the overall higher-level governance that is required to approve the proposed ideas. In addition to inhibiting the pace of innovation, this challenge is magnified by the diverse range of projects that large NPOs like the QF work on, as the higher-level management that are required to give the final approval may not fully appreciate the creativity or novelty of the proposed ideas. Using the RBV, large NPOs like the QF may have the necessary resources (such as adequate finances and human resources) to promote innovation and the overall success of the projects. However, they must also focus on how they can use these advantageous resources in the best way possible: they must enhance their capabilities of using their

heterogenous resources (DCT) by addressing aspects such as the vision and strategy to ensure that they use their resources in the most efficient manner.

The findings related to the NIS and PMS also help guide the study from the perspective of management innovation, where they help identify the key antecedents for management innovation in the QF and assess their impact on the innovation processes and performance. The underlying findings match those of the previous 2 cases associated with product innovation, whereby the antecedents identified in the conceptual framework are applicable to management innovation in the QF. The effect of the vision and strategy is more pronounced in this scenario as the PPE department is arranged in a more top-down approach than the QCIR department shown earlier (for product innovation).

Moreover, the third set of findings from the FM provide an insight into the topic from the perspective of process innovation. Unlike the QCRI and PPE departments, the FM department acts as more of a ‘service provider’ within QF for other departments. Process innovation deals with innovating the processes and techniques within the organisation to achieve a collective goal. The relevant literature in the field do not look at process innovation for NPOs in great detail as they focus primarily on product and management innovation. However, the related findings of this study show that process innovation is actually an important determinant of NPO success. This importance is explained by the DCT, as the processes and techniques used by the QF need to be constantly refined in response to the evolving operating landscape that the firm operates in. Innovating the techniques and processes used by the firm constantly improve the ‘capabilities’ of the firm which results in a sustained competitive edge. These findings were used to form a final framework of the study that identifies and categorises the key antecedents of innovation and shows their link to the stages of innovation and the measures of innovation performance.

Ultimately, the study was formed around the identified knowledge gap by answering the research question: What are the key internal antecedents of innovation within NPOs? How do they influence innovation processes and performance? This is answered using the final framework that identifies the antecedents of innovation as being at organisational, departmental or firm level. The antecedents are linked to the innovation process comprising of idea generation, diffusion and conversion, after which the effectiveness of innovation can be assessed using both objective and subjective means.

6.6. Theoretical Contributions of Study

This study fills the identified knowledge gap in literature where the key antecedents of innovation for large NPOs like the Qatar Foundation (QF) were not studied in extant literature; the antecedents of innovation were previously only presented for conventional, for-profit organisations. Moreover, this study shows the applicability of the Dynamic Capabilities Theory (DCT) and the Resource Based View (RBV) in the social context. These theories were built around how profit-maximising firms can use their heterogenous resources and capabilities to create a sustained competitive advantage. Although the ultimate objective of NPOs differs, the RBV illustrates the importance of their unique, heterogenous resources, and how NPOs can use them to best execute their projects designed around their social objectives. The DCT shows how NPOs can best use their capabilities to efficiently execute their projects, and the importance of adapting the capabilities in a dynamically changing environment. This is especially important given the highly constrained resources possessed by NPOs, as they have to use them in the most efficient manner to execute their social objectives.

6.7. Implications of Findings to the Various Stakeholders

The findings and emergent themes of this study have implications for the intended stakeholders including management, strategists, policy makers, future researchers of innovation in similar contexts. The most important implication is the effect of rigid governance and policies set by higher level management; management, strategists and policy makers must adopt a more flexible and accommodative stance with respect to governance and policies – such as the selection of appropriate human resources for a project – to match the dynamic landscape that the NPO operates in. Large, multi-sectoral NPOs like the QF are characterised by a rigid set of policies that aim to ensure that the projects are completed in line with the strategic vision of the company. However, this has an adverse effect on the level of innovation within the project that can ultimately increase the time for completion and reduce its efficacy and social impact, as many decisions require higher-level approvals. The rigidity of governance and policies can be reduced by giving lower-level management a higher degree of freedom when making decisions related to aspects of their projects, such as the selection of human resources. However, this comes with the risk of projects being run against the strategic vision of the company. This risk can be mitigated by regularly monitoring project performance using KPIs set along the strategic vision of the company as well as increasing the level of accountability of the new decision makers.

The second implication is with regards to the structure of the departments: NPOs like the QF must be more open to structuring their projects in a “bottom-up” manner without many hierarchal levels between the lower and higher-level staff. The cases that followed this idea were seen to innately promote innovation as many new ideas stemmed from lower-level staff that could be transmitted and implemented quickly. In contrast, “top-down” projects

inhibited innovation as the higher-level management did not fully grasp the dynamic landscape of the vast array of projects, thus reducing the creativity of decisions and ideas. This bottom-up structure can be universally applied to all of the projects to promote the generation of new ideas and streamline the flow of information.

Another implication is the priority that must be placed on motivating employees. Employees from all of the cases emphasised the need for motivation (financial, non-financial and self-driven motivation towards the social impact of the project). This can be increased by recruiting employees with a strong, self-driven motivation towards social innovation as well as providing additional financial and non-financial incentives based on the level of performance in the projects that they work on.

The final implication is the importance of having a collaborative culture within and across the different projects. Large, multi-sectoral NPOs like the QF must create an environment that promotes collaboration. The findings showed that collaboration with employees within and outside the project was essential as it enabled the exchange of ideas and solutions to problems, which reduced the time for completion and also increased the level of creativity in the solutions. This is especially important for NPOs like the QF where employees are made to work outside their field of expertise. The collaborative environment can be formed using formal (regular team meetings) and informal means.

6.8. Future Research

This research provided a unique and holistic insight into innovation considerations within non-profit organisations. Although the study was conducted on organisations in Qatar, the developed knowledge can be applied and perhaps extended in order to convey knowledge and have more robust exposure. Therefore, future research seeks to:

- Validate and evaluate the effectiveness of the framework across Qatar Foundation, and apply improvements to bring it at a national level.
- Apply the developed framework on innovation projects across different non-profit organisations and seek to reflect the value of holistic thinking in exposing the value and impact of innovation.
- Validate the extended application of theoretical underpinning (e.g. RBV and DCT) of the framework in different innovation projects considering into account the idea of holism and its impact in exposing innovation value and impact.
- Engage more stakeholders into the framework including end users, government officials and potentially funding organisations to expose value of the developed framework.

References

Adams, J., Khan, H.T., Raeside, R. and White, D.I., (2007). Research methods for graduate business and social science students. *SAGE publications India*. pp. 34-57.

Adams, R., Bessant, J. and Phelps, R., (2006). Innovation management measurement: A review. *International journal of management reviews*, *8*(1), pp.21-47.

Adams, R., Jeanrenaud, S., Bessant, J., Denyer, D. and Overy, P., (2016). Sustainability-oriented innovation: A systematic review. *International Journal of Management Reviews*, *18*(2), pp.180-205.

Affairs, M. o. F., (2020). Ministry of Foreign Affairs. [Online] Available at: https://mofa.gov.qa/en/qatar/history-of-qatar/general-information [Accessed 5 May 2020].

Aguinis, H. and Solarino, A. M. (2019) "Transparency and Replicability in Qualitative Research: The Case of Interviews with Elite Informants," *Strategic Management Journal*, 40(8), pp. 1291–1315. doi: 10.1002/smj.3015.

Akingbola, K. (2013). Context and nonprofit human resource management. *Administration & Society*, 45(8), pp. 974-1004.

Alänge, S., Jacobsson, S. and Jaryehammar, A., (1998). Some aspects of an analytical framework for studying the diffusion of organisational innovations. *Technology analysis & strategic management*, *10*(1), pp.3-22.

Alegre, J. (2009) "Assessing the Impact of Organizational Learning Capability on Product Innovation Performance: An Empirical Test," *Development and Learning in Organizations: An International Journal*, 23(2). pp. 23-45. doi: 10.1108/dlo.2009.08123bad.006.

Ali, A., Kalwani, M.U. and Kovenock, D., (1993). Selecting product development projects: Pioneering versus incremental innovation strategies. *Management Science*, *39*(3), pp.255-274.

Amabile, T.M., 1998. *How to kill creativity* (Vol. 87). Boston, MA: Harvard Business School Publishing.

Amanatidou, E., Gagliardi, D. and Cox, D., (2018). Social engagement: Towards a typology of social innovation. *MIOIR/MBS Working Paper Series-Working Paper*, *82*. pp. 3-18.

Anderson, N., Potočnik, K. and Zhou, J., (2014). Innovation and creativity in organisations: A state-of-the-science review, prospective commentary, and guiding framework. *Journal of management*, 40(5), pp.1297-1333.

Andreasen, A. R. (1982) “Nonprofits: Check Your Attention to Customers,” *Harvard Business Review*, 60(3), pp. 21-25.

Angel, L., Meroño-Cerdan, G., & López-Nicolas, C., (2013). Understanding the drivers oforganisation innovation. *The Service Industries Journal*, *33*(13), pp.1312-1325.

Anheier, H. K. (2014). Nonprofit organisations: Theory, management, policy, 2nd edition, London : Routledge. pp. 4-17.

Anon., (2020). Hamad Bin Khalifa Univeristy. [Online] Available at: https://www.hbku.edu.qa/en/about-qcri [Accessed 26 may 2020].

Antonioli , D., Manzalini, R., & Pini, P. (2011). Innovation, workers skills and industrial relations: Empirical evidence from firm-level Italian data. *The Journal of Socio-Economics*, 40, pp. 312-326.

Murat Ar, I. and Baki, B. (2011) “Antecedents and Performance Impacts of Product Versus Process Innovation,” *European Journal of Innovation Management*, 14(2), pp. 172–206. doi: 10.1108/14601061111124885.

Aranda, D. A. and Molina-Fernandez, L. M. (2002) “Determinants of Innovation through a Knowledge-Based Theory Lens,” *INDUSTRIAL MANAGEMENT AND DATA SYSTEMS*, 289-297, pp. 289–297.

Arundel, A., Smith, K., Patel, P. and Sirilli, G., (1998). The future of innovation measurement in Europe: Concepts, problems and practical direction., *IDEP Paper Series,* 3, pp. 4-32.

Asheim, B.T. and Coenen, L., (2005). Knowledge bases and regional innovation systems: Comparing Nordic clusters. *Research policy*, *34*(8), pp.1173-1190.

Astebro, T. (2004). Key Success Factors for Technological Entrepreneurs' R&D Projects. *IEEE Transactions on Engineering Management*. 51. pp. 314 - 321. 10.1109/TEM.2004.830863.

Attride-Stirling, J. (2001) ‘Thematic networks: an analytic tool for qualitative research’, *Qualitative Research, 1*(3), pp. 385–405. doi: 10.1177/146879410100100307.

Atuahene-Gima, K. and Ko, A., (2001). An empirical investigation of the effect of market orientation and entrepreneurship orientation alignment on product innovation. *Organisation science*, *12*(1), pp.54-74.

Authority, P. a. S., (2020). Planning and Statistics Authority 2. [Online] Available at: https://www.psa.gov.qa/en/statistics1/ft/Pages/reports.aspx [Accessed 21 May 2020].

Awate, S., Larsen, M. M., & Mudambi, R. (2012). EMNE catch-up strategies in the wind turbine industry: Is there a trade-off between output and innovation capabilities? *Global Strategy Journal*, 2, pp. 205-223.

Baer, M. and Oldham, G.R.,(2006). The curvilinear relation between experienced creative time pressure and creativity: moderating effects of openness to experience and support for creativity. *Journal of Applied Psychology*, 91(4), p.963.

Balachandra, R. and Friar, J.H., (1997). Factors for success in R&D projects and new product innovation: a contextual framework. *IEEE Transactions on Engineering management*, *44*(3), pp.276-287.

Bansal, P. T. and Corley, K. (2012) "From the Editors: Publishing in 'AMJ'—part 7: What's Different About Qualitative Research?," *The Academy of Management Journal*, 55(3), pp. 509–513.

Barczak, G., Griffin, A. and Kahn, K.B., (2009). Perspective: Trends and drivers of success in NPD practices: Results of the 2003 PDMA best practices study. *Journal of product innovation management*, *26*(1), pp.3-23.

Baregheh, A. et al. (2009) "Food Sector Smes and Innovation Types," *British Food Journal*, 114(11), pp. 1640–1653. doi: 10.1108/00070701211273126.

Barney, J., (1991). Firm resources and sustained competitive advantage. *Journal of management*, *17*(1), pp.99-120.

Barney, J.B., (1986). Strategic factor markets: Expectations, luck, and business strategy. *Management Science*, 32(10), pp.1231-1241.

Bartlett, C.A. and Ghoshal, S., (1990). Managing innovation in the transnational corporation. *Managing The Global Firm*, pp.215-255.

Basadur, M. and Gelade, G.A., (2006). The role of knowledge management in the innovation process. *Creativity and Innovation Management*, *15*(1), pp.45-62.

Battisti, G. and Stoneman, P., (2010). How innovative are UK firms? Evidence from the fourth UK community innovation survey on synergies between technological and organisational innovations. *British Journal of Management*, *21*(1), pp.187-206.

Baum, J.R. and Bird, B.J., (2010). The successful intelligence of high-growth entrepreneurs: Links to new venture growth. *Organisation Science*, 21(2), pp.397-412.

Baxter, P., & Jack, S. (2008). Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers. *The Qualitative Report*, *13*(4), pp.544-559.

Becker, S.W. and Whisler, T.L., (1967). The innovative organisation: A selective view of current theory and research. *The Journal of Business*, *40*(4), pp.462-469.

Behrens, J., (2016). A lack of insight: an experimental analysis of R&D managers' decision making in innovation portfolio management. *Creativity and Innovation management*, *25*(2), pp.239-250.

Behrens, J., Ernst, H. and Shepherd, D.A., (2014). The decision to exploit an R&D project: Divergent thinking across middle and senior managers. *Journal of Product Innovation Management*, *31*(1), pp.144-158.

Bennett, N. and Parks, J.M., (2015). Struggling to innovate? Examine your structure, systems, and culture. *Business Horizons*, *58*(5), pp.563-569.

Bessant, J. and Tidd, J., (2007). *Innovation and entrepreneurship*. John Wiley & Sons. pp. 6-25.

Beugelsdijk, S. (2008) 'Strategic Human Resource Practices and Product Innovation', *Organization Studies, 29*(6), pp. 821–847. doi: 10.1177/0170840608090530.

Bircan, I. and Gencler, F., (2015). Analysis of innovation-based human resources for sustainable development. *Procedia-social and Behavioural Sciences*, *195*, pp.1348-1354.

Birkinshaw, J., Hamel, G. and Mol, M.J., (2008). Management innovation. *Academy of management Review*, *33*(4), pp.825-845.

Bisel, R.S. and Adame, E.A., (2017). Post-positivist/functionalist approaches. *The international encyclopedia of organisational communication*, pp.1-22.

Bizri, O. F. (2017) *Science, technology, innovation, and development in the arab countries*. San Diego, CA: Academic Press. pp. 45-68.

Blauth, M., Mauer, R. and Brettel, M., (2014). Fostering creativity in new product development through entrepreneurial decision making. *Creativity and Innovation Management*, *23*(4), pp.495-509.

Boer, H. and During, W.E., (2001). Innovation, what innovation? A comparison between product, process and organisational innovation. *International Journal of Technology Management*, *22*(1-3), pp.83-107.

Bouncken, Ricarda & Clauß, Thomas & Fredrich, Viktor. (2016). Product innovation through coopetition in alliances: Singular or plural governance?. *Industrial Marketing Management*. 53. pp.77-90. 10.1016/j.indmarman.2015.11.011.

Brătianu, C. and Bălănescu, G.V., (2008). Vision, mission and corporate values. A comparative analysis of the top 50 US companies. *Management & Marketing*, *3*(3), pp.19-38.

Braun, V. and Clarke, V. (2013) *Successful Qualitative Research: a practical guide for beginners,* London, Sage Publication. pp. 16-20.

Brink, T. (2019) “Orchestration of Dynamic Capabilities for Competitive Advantage,” International *Journal of Energy Sector Management*, 13(4), pp. 960–976. doi: 10.1108/IJESM-09-2018-0005.

Brook, J.W. and Pagnanelli, F., (2014). Integrating sustainability into innovation project portfolio management–A strategic perspective. *Journal of Engineering and Technology Management*, 34, pp.46-62.

Brophey, G., Baregheh, A., & Hemswor, D. (2013). Innovation process, decision- making, perceived risks and metrics: A dynamics test. *International Journal of Innovation Management*, 17 (3), pp. 1-22.

Brown, R. *et al.* (2012) “Tackling Cancer Burden in the Middle East: Qatar As an Example,” *Lancet Oncology*, 13(11), p. 508. doi: 10.1016/S1470-2045(12)70461-8.

Bruneel, J., Van de Velde, E., Clarysse, B., & Gemmel, P. (2012). Improving the success of radical innovation projects within established firms: engaging employees across different hierarchal levels. Technology Analysis & Strategic *Management*, 24 (9), 951-965.

Bryman, A. (2016). Social research methods. Oxford university press. pp. 1-57.

Bryson, J. M., Ackermann, F., & Eden, C. (2007). Putting the resource-based view of strategy and distinctive competencies to work in public organisations. *Public Management Review*, 67, pp. 702-717.

Bunduchi, R. (2009). Implementing best practices to support creativity in npd cross- functional teams. *International Journal of Innovation Management*, 13 (4), pp. 537-554.

Büschgens, T., Bausch, A. and Balkin, D.B., (2013). Organizing for radical innovation—A multi-level behavioral approach. *The Journal of High Technology Management Research*, *24*(2), pp.138-152.

Business Council of Australia. (1993). Employee Relations Study Commission and Hilmer, *Working relations: A fresh start for Australian enterprises*. Business Library. p.13

Dobni, C. B. (2008) “The Dna of Innovation,” *The Journal of Business Strategy*, 29(2), pp. 43–50. doi: 10.1108/02756660810858143.

Camelo-Ordaz, C., García-Cruz, J. and Sousa-Ginel, E., (2015). The influence of top management team conflict on firm innovativeness. *Group Decision and Negotiation*, 24(6), pp.957-980.

Camisón, C. and Puig-Denia, A., (2016). Are quality management practices enough to improve process innovation?. *International Journal of Production Research*, *54*(10), pp.2875-2894.

Carson, D. & Gilmore, Audrey & Perry, Chad & Grønhaug, Kjell. (2001). Qualitative Market Research. pp. 5-17.

Cassiman, B., Di Guardo, M.C. and Valentini, G., (2009). Organising R&D projects to profit from innovation: Insights from co-opetition. *Long Range Planning*, *42*(2), pp.216-233.

Chai, K.H., Wang, Q., Song, M., Halman, J.I. and Brombacher, A.C., (2012). Understanding competencies in platform-based product development: Antecedents and outcomes. *Journal of product innovation management*, *29*(3), pp.452-472.

Cheema, K.Q, & Saeed, Z., (2015). Impact of Dynamic Capabilities on Firm Performance: Moderating Role of Organisational Competencies. *Sukkur IBA Journal of Management and Business*. 2., pp.18-40. 10.30537/sijmb.v2i2.92.

Chen, G. and Muller, A., (2010). Measuring innovation from different perspectives. *Employment Relations Today*, 37(1), pp.1-8.

Chen, J., Damanpour, F. and Reilly, R.R., (2010). Understanding antecedents of new product development speed: A meta-analysis. *Journal of Operations Management*, *28*(1), pp.17-33.

Chen, S.T. and Chang, B.G., (2012). The effects of absorptive capacity and decision speed on organisational innovation: a study of organisational structure as an antecedent variable. *Contemporary Management Research*, *8*(1). pp. 27 – 50.

Chenail, R.J., (2009). Interviewing the investigator: Strategies for addressing instrumentation and researcher bias concerns in qualitative research. *The Qualitative Report*, 13(4), pp.14-21.

Cheng, C. F., Chang, M. L., & Li, C. S. (2013). Configural paths to successful product innovation. *Journal of Business Research*, 2013, pp. 2561-2573.

Cheng, J. H., Yeh, C. H. and Tu, C. W. (2008) “Trust and Knowledge Sharing in Green Supply Chains,” *Supply Chain Management: An International Journal*, 13(4), pp. 283–295. doi: 10.1108/13598540810882170.

Cherrafi, A., Garza-Reyes, J.A., Kumar, V., Mishra, N., Ghobadian, A. and Elfezazi, S., (2018). Lean, green practices and process innovation: A model for green supply chain performance. *International Journal of Production Economics*, *206*, pp.79-92.

Chesbrough, H. (2007) “Business Model Innovation: It's Not Just About Technology Anymore,” *Strategy & Leadership*, 35(6), pp. 12–17. doi: 10.1108/10878570710833714.

Chiesa, V. and Frattini, F., (2011). Commercializing technological innovation: Learning from failures in high-tech markets. *Journal of Product Innovation Management*, *28*(4), pp.437-454.

Choi, S. (2012) “An Inside-Out Marketing Strategy for Innovation among Human Service Nonprofits in South Korea,” *Nonprofit Management and Leadership*, 26(3), pp. 331–347. doi: 10.1002/nml.21196.

Christiansen, J.K. and Varnes, C.J., (2009). Formal rules in product development: Sensemaking of structured approaches. *Journal of Product Innovation Management*, *26*(5), pp.502-519.

Christmann, P. (2000). Effects of “best practices” of environmental management on cost advantage: The role of complementary assets. *Academy of Management Journal*, 43, pp. 663-680.

Cohen, L., Manion, L. and Morrison, K., (2013). Research methods in education. Routledge. pp. 7-24.

Collis, J. and Hussey, R. (2014). *Business research.* 4th ed. Basingstoke: Palgrave Macmillan. pp. 7-32.

Collins, C.J. and 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*(3), pp.544-560.

Cooper, R. G. (2011). Perspective: The innovation dilemma: How to innovate when the market is mature. *Journal of Product Innovation Management*, 28 (s1): pp. 2–27.

Cooper, R.G. and Kleinschmidt, E.J., (1990). New product success factors: a comparison of ‘kills’ versus successes and failures. *R&D Management*, *20*(1), pp.47-63.

Cooper, R.G., Edgett, S.J. and Kleinschmidt, E.J., (2004). Benchmarking best NPD practices—I. *Research-Technology Management*, *47*(1), pp.31-43.

Cotterman, R., Fusfeld, A., Henderson, P., Leder, J., Loweth, C. and Metoyer, A., (2009). Aligning marketing and technology to drive innovation. *Research-Technology Management*, *52*(5), pp.14-20.

Cozijnsen, A.J., Vrakking, W.J. and van IJzerloo, M., (2000). Success and failure of 50 innovation projects in Dutch companies. *European Journal of Innovation Management*. *7*(1). pp. 104-153.

Cresswell, J. W. (Ed.). (2003). Research design: Qualitative, quantitative, and mixed methods approaches. (2nd ed. ed.). Thousand Oaks: Sage. pp. 8-46.

Creswell, J. W. (2014). Research design: Qualitative, Quantitative, and Mixed Methods Approaches (4 ed.). London: SAGE Publications, Inc. pp. 9-53.

Creswell, J.W. and Poth, C.N., (2016). Qualitative inquiry and research design: Choosing among five approaches. Sage publications. pp. 3-45.

Creswell, J.W., (2011). Controversies in mixed methods research. *The Sage handbook of qualitative research*, 4, pp.269-284.

Creswell, J.W., Hanson, W.E., Clark Plano, V.L. and Morales, A., (2007). Qualitative research designs: Selection and implementation. *The counselling psychologist*, 35(2), pp.236-264.

Crist, J.T. (2015) "Innovation in a Small State: Qatar and the IBC Cluster Model of Higher Education," *The Muslim World (Hartford),* 105(1), pp.93–115.

Crossan, M.M. and Apaydin, M., (2010). A multi-dimensional framework of organisational innovation: A systematic review of the literature. *Journal of management studies*, 47(6), pp.1154-1191.

Crotty, M., (1998). The foundations of social research: Meaning and perspective in the research process. Sage. pp. 6-35.

Crowther, D., & Lancaster, G. (2008). Research methods: A concise introduction to research in management and business consultancy (2 ed.). Oxford: Elsevier Butterworth-Heinemann. pp. 9-17.

Cucculelli, M. and Peruzzi, V. (2020) "Innovation Over the Industry Life-Cycle. Does Ownership Matter?," *Research Policy*, 49(1). pp. 67-89. doi: 10.1016/j.respol.2019.103878.

Cuervo-Cazurra, A. *et al.* (2016) "Editorial: From the Editors: Can I Trust Your Findings? Ruling Out Alternative Explanations in International Business Research," *Journal of International Business Studies*, 47(8), pp. 881–897.

D'Este, P., Mahdi, S., Neely, A., & Rentocchini, F. (2012). Inventors and entrepreneurs in academia: What types of skills and experience matter?. *Technovation*. 32. pp. 292-303. 10.2139/ssrn.1951845.

Damanpour, F. (1996) Organisational Complexity and Innovation: Developing and Testing Multiple Contingency Models. *Management Science*, 42, pp. 693-716. doi: https://doi.org/10.1287/mnsc.42.5.693

Damanpour, F. and Evan, W.M., (1984). Organisational innovation and performance: the problem of" organisational lag". *Administrative science quarterly*, pp.392-409.

Damanpour, F. and Gopalakrishnan, S., (1998). Theories of organisational structure and innovation adoption: the role of environmental change. *Journal of Engineering and technology management*, *15*(1), pp.1-24.

Damanpour, F., & Schneider, M. (2006). Phases of the Adoption of Innovation in Organisations: Effects of Environment, Organisation and Top Managers. *British Journal of Management*, 17, pp. 215-236.

Damanpour, F., & Schneider, M. (2009). Characteristics of Innovation and Innovation Adoption in Public Organisations: Assessing the Role of Managers. Journal of Public Administration Research & Theory 19 (3), pp. 495-522

Damanpour, F., (1992). Organisational size and innovation. *Organisation studies*, *13*(3), pp.375-402.

Damanpour, Fariborz & Walker, Richard & Avellaneda, Claudia. (2009). Combinative Effects of Innovation Types and Organisational Performance: A Longitudinal Study of Service Organisations. *Journal of Management Studies*. 46. pp. 650-675. 10.1111/j.1467-6486.2008.00814.x.

Damanpour, F. and Aravind, D. (2012) "Managerial Innovation: Conceptions, Processes and Antecedents," *Management and Organisation Review*, 8(2), pp. 423–454. doi: 10.1111/j.1740-8784.2011.00233.x.

Daugherty, P.J., Chen, H. and Ferrin, B.G., (2011). Organisational structure and logistics service innovation. *The International Journal of Logistics Management*. *8(1).* pp. 76-89.

De Castro, G.M., Verde, M.D., Sáez, P.L. and López, J.E.N., (2010). Technological Innovation. *Technological Innovation*, pp. 46-72

De Marchi, V. (2012). Environmental innovation and R&D cooperation: empirical evidence from Spanish manufacturing firms. *Research Policy*, 41, pp. 614-623.

De Medeiros, J.F., Ribeiro, J.L.D. and Cortimiglia, M.N., (2014). Success factors for environmentally sustainable product innovation: a systematic literature review. *Journal of Cleaner Production*, *65*, pp.76-86.

de Oliveira, M.G., Rozenfeld, H., Phaal, R. and Probert, D., (2015). Decision making at the front end of innovation: the hidden influence of knowledge and decision criteria. *R&D Management*, *45*(2), pp.161-180.

De Quinn, J.B., (2000). Outsourcing innovation: the new engine of growth. Sloan Management. pp. 8-42.

De Visser, M. and Faems, D., (2015). Exploration and Exploitation within Firms: The Impact of CEO s' Cognitive Style on Incremental and Radical Innovation Performance. *Creativity and innovation management*, *24*(3), pp.359-372.

DeCarolis, D.M. and Deeds, D.L., (1999). The impact of stocks and flows of organisational knowledge on firm performance: An empirical investigation of the biotechnology industry. *Strategic management journal*, 20(10), pp.953-968.

Deichmann, D., Moser, C., Birkholz, J.M., Nerghes, A., Groenewegen, P. and Wang, S., (2020). Ideas with impact: How connectivity shapes idea diffusion. *Research Policy*, 49(1), p.103881.

Denscombe, M., (2005). Research ethics and the governance of research projects: the potential of Internet home pages. *Sociological Research Online*, 10(3), pp.80-89.

Dereli, T., Durmusoglu, A. and Daim, T.U., (2011). Buyer/seller collaboration through measurement of beliefs on innovativeness of products. *Computers in Industry*, *62*(2), pp.205-212.

Donate, M. J., & Guadamillas, F. (2011). Organisational factors to support knowledge management and innovation. *Journal of Knowledge Management* , 15 (6), pp. 890-914.

Drnevich, P.L. and Kriauciunas, A.P., (2011). Clarifying the conditions and limits of the contributions of ordinary and dynamic capabilities to relative firm performance. *Strategic management journal*, 32(3), pp.254-279.

Drucker, P.F., (1985). Entrepreneurial strategies. *California Management Review*, *27*(2). pp. 9-25.

Du Plessis, M., (2007). The role of knowledge management in innovation. *Journal of knowledge management*. pp. 20-29.

Dudau, A., Kominis, G. and Szocs, M., (2018). Innovation failure in the eye of the beholder: towards a theory of innovation shaped by competing agendas within higher education. *Public Management Review*, *20*(2), pp.254-272.

Easterby-Smith, M., Thorpe, R., & Jackson, P. (2015). Management and business research. London: SAGE edge. pp. 1-45.

Ebadi, Y.M. and Utterback, J.M., (1984). The effects of communication on technological innovation. *Management science*, *30*(5), pp.572-585.

Edmondson, A. C. and McManus, S. E. (2007) “Methodological Fit in Management Field Research,” *Academy of Management. The Academy of Management Review*, 32(4), pp. 1155–1179.

Edquist, C., Hommen, L. and McKelvey, M.D., (2001). *Innovation and employment: Process versus product innovation*. Edward Elgar Publishing. pp. 11-32.

Edwards-Schachter, M. and Wallace, M.L., (2017). ‘Shaken, but not stirred’: Sixty years of defining social innovation. *Technological Forecasting and Social Change*, *119*, pp.64-79.

Edwards-Schachter, M., García-Granero, A., Sánchez-Barrioluengo, M., Quesada-Pineda, H. and Amara, N., (2015). Disentangling competences: Interrelationships on creativity, innovation and entrepreneurship. *Thinking skills and creativity*, *16*, pp.27-39.

Eikenberry, A. M. (2004) "The Marketization of the Nonprofit Sector: Civil Society at Risk?," *Public Administration Review*, 64(2), pp. 132–140. doi: 10.1111/j.1540-6210.2004.00355.x.

Eisenhardt, K.M. and Graebner, M.E., (2007). Theory building from cases: Opportunities and challenges. *Academy of management journal*, 50(1), pp.25-32.

Eisenhardt, K.M. and Martin, J.A., (2000). Dynamic capabilities: what are they?. *Strategic management journal*, 21(10-11), pp.1105-1121.

Elgendy, Y. A. (2011) 'Energy Auditing:Towards Energy Balance for Qatar Vision 2030', Qatar Foundation Annual Research. Qatar Environment and Energy Research Institute, Doha, Qatar. Available at: https://www.qscience.com/content/papers/10.5339/qfarf.2011.EGP13#abstract_content (Accessed: 27 June 2020)

Ettlie, J. E. and Reza, E. M. (1992) "Organisational Integration and Process Innovation," *The Academy of Management Journal*, 35(4), pp. 795–827.

Evanschitzky, H., Eisend, M., Calantone, R. J., & Jiang, Y. (2012). Success Factors of Product Innovation - An Updated Meta-Analysis. *Journal of Product Innovation Management*, 29 (S1), pp. 21-37.

Fagerberg, J. and Verspagen, B. (2008) "Innovation Studies—the Emerging Structure of a New Scientific Field," *Research Policy*, 38(2), pp. 218–233. doi: 10.1016/j.respol.2008.12.006.

Fay, D., Shipton, H., West, M. A., & Patterson, M. (2015). Teamwork and organisational innovation: The moderating role of the HRM context. *Creativity and Innovation Management*, 24 (2), 261-277.

Flight, R.L. and Palmer, R.J., (2013). Organisational structure and intra-firm innovation diffusion. *Marketing Management Journal*, *23*(2), pp.35-57.

Ford, S., Garnsey, E. and Probert, D., (2010). Evolving corporate entrepreneurship strategy: technology incubation at Philips. *R&d Management*, *40*(1), pp.81-90.

Fougère, M., Segercrantz, B. and Seeck, H., (2017). A critical reading of the European Union's social innovation policy discourse:(Re) legitimizing neoliberalism. *Organisation*, *24*(6), pp.819-843.

Qatar Foundation, (2020). Qatar Foundation. [Online] Available at: https://www.qf.org.qa/about [Accessed 22 May 2020].

Fox, N.J., (2008). Postpositivism. The SAGE encyclopedia of qualitative research methods, 2, pp.659-664.

Fritsch, M. and Meschede, M. (2001) “Product Innovation, Process Innovation, and Size,” *Review of Industrial Organisation*, 19(3), pp. 335–350. doi: 10.1023/A:1011856020135.

Fritz, C., Lam, C.F. and Spreitzer, G.M., (2011). It's the little things that matter: An examination of knowledge workers' energy management. *Academy of Management Perspectives*, *25*(3), pp.28-39.

Gabriel, A., Camargo, M., Monticolo, D., Boly, V. and Bourgault, M.,(2016). Improving the idea selection process in creative workshops through contextualisation. *Journal of cleaner production*, *135*, pp.1503-1513.

Gage, N., (2007). The paradigm wars and their aftermath(p. 152). Sage Publications, London. pp. 9-54.

Gall, J. P., Gall, M. D. and Borg, W. R. (1999) *Applying educational research : a practical guide*. 4th edn. New York: Longman. pp. 7-23.

Galliers, R. (1991). Choosing Appropriate Information Systems Research Approaches: A Revised Taxonomy. *The Information Research Arena of the 90s*. 155–173.

Gallouj, F., (2002). *Innovation in the service economy: the new wealth of nations*. Edward Elgar Publishing. pp. 43-75.

Gamal, D., Salah, E.T. and Elrayyes, E.N., (2011). How to measure organisation Innovativeness. *Technology Innovation and Entrepreneurship Center*. pp. 1-35.

Ganter, A., & Hecker, A. (2014). Configurational paths to organisational innovation: Qualitative comparative analyses of antecedents and contingencies. Journal of Business Research , 67, pp. 1285-1292.

Garud, R., Tuertscher, P. and Van de Ven, A.H., (2013). Perspectives on innovation processes. *Academy of Management Annals*, *7*(1), pp.775-819.

Gault, F. ed., (2013). *Handbook of innovation indicators and measurement*. Edward Elgar Publishing. pp. 8-76.

Ghauri, P. N. and Grønhaug, K. (2005) *Research methods in business studies : a practical guide*. 3rd edn. Harlow, England: Financial Times Prentice Hall. pp. 7-135.

Ghauri, P., (2004). Designing and conducting case studies in international business research. Handbook of qualitative research methods for international business, 1(1), pp.109-124.

Gianiodis, P. T., Ettlie , J. E., & Urbina, J. J. (2014). Open service innovation in the global banking industry: Inside-out versus outside-in strategies. *The Academy of Management Perspectives*, 28 (1), pp. 76-91.

Gilbert, M. and Cordey-Hayes, M., (1996). Understanding the process of knowledge transfer to achieve successful technological innovation. *Technovation*, *16*(6), pp.301-312.

Gnyawali , D. R., & Srivastava, M. K. (2013). Complementary effects of clusters and networks on firm innovation: A conceptual model. *Journal of Engineering and Technology Management*, 30, pp. 1-20.

Gobble, M.M., (2016). Defining disruptive innovation. *Research-Technology Management*, *59*(4), pp.66-71.

Goodale, J. C. *et al.* (2011) "Operations Management and Corporate Entrepreneurship: The Moderating Effect of Operations Control on the Antecedents of Corporate Entrepreneurial Activity in Relation to Innovation Performance," *Journal of Operations Management*, 29(1-2), pp. 116–127. doi: 10.1016/j.jom.2010.07.005.

Greener, S. (2008). Business Research Method (Online ed.). Ventus Publishing ApS. pp. 8-17.

Griffin, A. (1997). The effect of project and process characteristics on product development cycle time. *Journal of Marketing Research*, 34 (1), pp. 24-35.

Guba, E.G., (1990). The Paradigm Dialog. Newbury Park, California: Sage Publications. pp. 5-27

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (p. 105–117). Sage Publications, Inc.
Guimaraes, T. and Langley, K., (1994) "Developing Innovation Benchmarks: An Empirical Study," *Benchmarking for Quality Management & Technology*, 1(3), pp. 3–21.

Gummer, B. (2001). Innovate or die: The necessity for change in contemporary organisations. *Administration in Social Work*, 25(3), pp. 65–85

Gunday, G., Ulusoy, G., Kilic, K. and Alpkan, L., (2011). Effects of innovation types on firm performance. *International Journal of production economics*, *133*(2), pp.662-676.

Güttel, W.H. and Konlechner, S.W., (2009). Continuously hanging by a thread: Managing contextually ambidextrous organisations. *Schmalenbach Business Review*, 61(2), pp.150-172.

Haapanen, L., Hurmelinna-Laukkanen, P. and Hermes, J., (2018). Firm functions and the nature of competitive advantage in internationalizing smes. *International Journal of Innovation Management*, *22*(03), p.1850022.

Habbershon, T.G. and Williams, M.L., (1999). A resource-based framework for assessing the strategic advantages of family firms. *Family business review*, 12(1), pp.1-25.

Hacking, I., (1983). Nineteenth century cracks in the concept of determinism. *Journal of the History of Ideas,* pp.455-475.

Hagedoorn, J., (1996). Innovation and entrepreneurship: Schumpeter revisited. *Industrial and corporate change*, *5*(3), pp.883-896.

Hakim, C., (2000). Research design: Successful designs for social and economic research. *Psychology Press*. pp. 56-98.

Hambrick, D.C., Finkelstein, S. and Mooney, A.C., (2005). Executive job demands: New insights for explaining strategic decisions and leader behaviors. *Academy of management review*, *30*(3), pp.472-491.

Hamel, G., (1999). Bringing silicon valley inside. *Harvard Business Review*, *77*(5), pp.71-71.

Hamel, G., (2006). The why, what, and how of management innovation. *Harvard business review*, *84*(2), p.72.

Hansen, M.T. and Birkinshaw, J., (2007). The innovation value chain. *Harvard Business Review, 85*(6), pp.121 - 130.

Hansen, S.O. and Wakonen, J., (1997). Innovation, a winning solution?. *International Journal of Technology Management*, *13*(4), pp.345-358.

Hansmann, H. B. (1980). The role of nonprofit enterprise. *Yale Law Journal*, 89(5): pp. 835– 901.

Harper, S., (1992). Caring for China's Ageing Population: The Residential Option—A Case Study of Shanghai. *Ageing & Society*, 12(2), pp.157-184.

Hauser, J., Tellis, G.J. and Griffin, A., (2006). Research on innovation: A review and agenda for marketing science. *Marketing science*, *25*(6), pp.687-717.

Helfat, C. E., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D., et al. (2007). Dynamic Capabilities: Understanding Strategic Change in Organisations. New York: Wiley. pp. 5-67.

Helfat, C.E. and Peteraf, M.A., (2003). The dynamic resource-based view: Capability lifecycles. *Strategic management journal*, 24(10), pp.997-1010.

Helfat, C.E. and Peteraf, M.A., (2015). Managerial cognitive capabilities and the microfoundations of dynamic capabilities. *Strategic management journal*, *36*(6), pp.831-850.

Henriques, J., Hollway, W., Urwin, C., Venn, C., & Walkerdine, V. (1998). *Changing the subject: Psychology, social regulation and subjectivity.* Taylor & Frances/Routledge. pp. 76-112.

Hernández-Espallardo, M., Sánchez-Pérez, M. and Segovia-López, C., (2011). Exploitation-and exploration-based innovations: The role of knowledge in inter-firm relationships with distributors. *Technovation*, *31*(5-6), pp.203-215.

Herrera, M.E.B., (2016). Innovation for impact: Business innovation for inclusive growth. *Journal of Business Research*, *69*(5), pp.1725-1730.

Hervas-Oliver, J.L., Sempere-Ripoll, F. and Arribas, I., (2015). Asymmetric modeling of organisational innovation. *Journal of Business Research*, *68*(12), pp.2654-2662.

Hitt, Michael & Ireland, R. & Camp, Michael & Sexton, Donald. (2001). Strategic Entrepreneurship: Entrepreneurial Strategies for Wealth Creation. *Strategic Management Journal.* 22. pp. 479 - 491. 10.1002/smj.196.

Hjalager, A.M., (2010). A review of innovation research in tourism. *Tourism management*, *31*(1), pp.1-12.

Hoarau, H. and Kline, C., (2014). Science and industry: Sharing knowledge for innovation. *Annals of Tourism Research*, *46*, pp.44-61.

Hogan, S.J. and Coote, L.V., (2014). Organisational culture, innovation, and performance: A test of Schein's model. *Journal of business research*, *67*(8), pp.1609-1621.

Holloway, I. and Wheeler, S., (1996). Qualitative research for nurses (pp. p115-129). Oxford: Blackwell Science. pp. 17-65.

Hölzl, W. and Janger, J., (2014). Distance to the frontier and the perception of innovation barriers across European countries. *Research Policy*, *43*(4), pp.707-725.

Howaldt, J. and Hochgerner, J., (2018). Desperately seeking: A shared understanding of social innovation. *Atlas of Social Innovation—New Practices for a Better Future; Howaldt, J., Kaletka, C., Schröder, A., Zirngiebl, M., Eds*, pp.17-21.

Howaldt, J., Butzin, A., Domanski, D. and Kaletka, C.,(2014). Theoretical approaches to social innovation-a critical literature review. *A deliverable of the project:'Social Innovation: Driving Force of Social Change'(SI-DRIVE). Dortmund: Sozialforschungsstelle*. pp. 8-19.

Hristov, L. and Reynolds, J. (2015) “Perceptions and Practices of Innovation in Retailing,” *International Journal of Retail & Distribution Management*, 43(2), pp. 126–147. doi: 10.1108/IJRDM-09-2012-0079.

Hsu, C.-W., Lien, Y.-C., & Chen, H. (2015). R&D internationalization and innovation performance. *International Business Review*, 24, 187-195.

Hsu, M.L. and Fan, H.L., (2010). Organisational innovation climate and creative outcomes: Exploring the moderating effect of time pressure. *Creativity Research Journal*, 22(4), pp.378-386.

Hullova, D., Trott, P. and Simms, C. D. (2016) “Uncovering the Reciprocal Complementarity between Product and Process Innovation,” *Research Policy*, 45(5), pp. 929–939.

Husain, Z., Dayan, M. and Di Benedetto, C.A., (2016). The impact of networking on competitiveness via organisational learning, employee innovativeness, and innovation process: A mediation model. *Journal of Engineering and Technology Management*, *40*, pp.15-28.

Hwang, H. & Powell, W. (2009). The Rationalization of Charity: The Influences of Professionalism in the Nonprofit Sector. *Administrative Science Quarterly - ADMIN SCI QUART*. 54. pp. 268-298. 10.2189/asqu.2009.54.2.268.

Imenda, Sitwala. (2014). Is There a Conceptual Difference between Theoretical and Conceptual Frameworks?. *Journal of Social Sciences*. 38. pp. 185-195. 10.1080/09718923.2014.11893249.

Jabareen, Y., (2009). Building a conceptual framework: philosophy, definitions, and procedure. *International journal of qualitative methods*, 8(4), pp.49-62.

Janger, J., Schubert, T., Andries, P., Rammer, C., & Hoskens , M. (2017). The EU 2020 innovation indicator: A step forward in measuring innovation outputs and outcomes? *Research Policy*, 46, pp. 30-42.

Jansen, J.J., George, G., Van den Bosch, F.A. and Volberda, H.W., (2008). Senior team attributes and organisational ambidexterity: The moderating role of transformational leadership. *Journal of Management Studies*, *45*(5), pp.982-1007.

Jansen, J.J., Van Den Bosch, F.A. and Volberda, H.W., (2006). Exploratory innovation, exploitative innovation, and performance: Effects of organisational antecedents and environmental moderators. *Management science*, *52*(11), pp.1661-1674.

Jaskyte, K. (2004). Transformational leadership, organisational culture, and innovativeness in nonprofit organisations. *Nonprofit Management and Leadership*, 15(2), pp. 153–168.

Jaskyte, K., & Dressler, W. W. (2005). Organisational culture and innovation in nonprofit human service organisations. *Administration in Social Work*, 29(2), pp. 23–41.

Jaskyte, K., & Lee, M. (2006). Interorganisational relationships: A source of innovation in nonprofit organisations? *Administration in Social Work*, 30(3), pp. 43–54

Jayaram, J., Oke, A., & Prajogo, D. (2014). The antecedents and consequences of product and process innovation strategy implementation in Australian manufacturing firms. *International Journal of Production Research*, 52 (15), pp. 4424-4439.

Jeong, B. and Kearns, K. (2015) "Accountability in Korean Npos: Perceptions and Strategies of Npo Leaders," *VOLUNTAS: International Journal of Voluntary and Nonprofit Organisations: Official journal of the International Society for Third-Sector Research,* 26*(5),* pp. 1975–2001. doi: 10.1007/s11266-014-9492-8.

de Jong, J. P. and Marsili, O. (2014) "The distribution of Schumpeterian and Kirznerian Opportunities," *Small Business Economics*, 44(1), pp.19–35.

Jimenez, D. J., & Valle, R. S. (2008). Could HRM support organisational innovation? The *International Journal of Human Resource Management*, 19 (7), pp. 1208-1221.

Jones, J.N., Cope, J. and Kintz, A., (2016). Peering into the Future of Innovation Management: As the world changes, innovation professionals consider what the future holds for innovation and innovation management. *Research-Technology Management*, *59*(4), pp.49-58.

Kach, A., Azadegan, A. and Dooley, K.J., (2012). Analyzing the successful development of a high-novelty innovation project under a time-pressured schedule. *R&D Management*, *42*(5), pp.377-400.

Kalu, A., and Bwalya, J. (2017). What makes qualitative research good research?. *International Journal of Social Science Research*, *5*(2), pp.43-56.

Keeley, L., Walters, H., Pikkel, R. and Quinn, B., (2013). *Ten types of innovation: The discipline of building breakthroughs*. John Wiley & Sons. pp. 3-25.

Kekäle, T. and Kola-Nyström, S., (2007). Successful innovations from an established company. *Business strategy series*. pp. 18-75.

Kelemen, M., & Rumens, N. (2008). An introduction to critical management research. London: SAGE Publications, Inc. pp. 1-45.

Keown OP *et al.* (2014) "Lessons from Eight Countries on Diffusing Innovation in Health Care," *Health affairs (Project Hope)*, 33(9), pp. 1516–22. doi: 10.1377/hlthaff.2014.0382.

Kester, L., Griffin, A., Hultink, E.J. and Lauche, K., (2011). Exploring portfolio decision-making processes. *Journal of Product Innovation Management*, *28*(5), pp.641-661.

Keupp, M. M., Palmie, M., & Gassmann, O. (2012). The Strategic Management of Innovation: A Systematic Review and Paths for Future Research. *International Journal of Management Reviews*, 14, pp.367-390.

Kim, J. and Lee, S., (2015). Patent databases for innovation studies: A comparative analysis of USPTO, EPO, JPO and KIPO. *Technological Forecasting and Social Change*, *92*, pp.332-345.

Kim, S. K., Arthurs, J. D., Sahaym, A., & Cullen, J. B. (2013). Search behavior of the diversified firm: The impact of fit on innovation. *Strategic Management Journal*, 34, pp.999-1009.

Kirzner, I. (1973), *Competition and Entrepreneurship*, Chicago, IL, US: University of Chicago Press. pp. 8-75.

Klaukien, A., Shepherd, D. A., & Patzelt, H. (2012). Passion for Work, Nonwork- Related Excitement, and Innovation Managers' Decision to Exploit New Product Opportunities. *Journal of Product Innovation Management*, 30 (3), pp. 574-588.

Klen, H., & Meyers, M. (1998). A set of principles for conducting and evaluating interpretive field studies in information systems. Retrieved 12/9/2009, from http://www.auckland.au.nz/msis/isworld/MMyers/Klein-Myers.html

Knight, J., (2014). International Education Hubs. New York: Springer. pp. 16-54.

Knight, K.E., (1967). A descriptive model of the intra-firm innovation process. *The journal of business*, *40*(4), pp.478-496.

Ko, K.K., To, C.K., Zhang, Z.M., Ngai, E.W. and Chan, T.L., (2011). Analytic collaboration in virtual innovation projects. *Journal of Business Research*, *64*(12), pp.1327-1334.

Koberg, C. S., Detienne, D. R., & Heppard, K. A. (2003). An empirical test of environmental, organisational, and process factors affecting incremental and radical innovation. *Journal of High Technology Management Research*, 14 (1), pp. 21-45.

Kogut, B. and Zander, U., (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organisation science*, 3(3), pp.383-397.

Kostopoulos, K.C., Spanos, Y.E. and Prastacos, G.P., (2002). The resource-based view of the firm and innovation: identification of critical linkages. *In The 2nd European Academy of Management Conference*, pp. 1-19.

Koufteros, X.A., Cheng, T.E. and Lai, K.H., (2007). “Black-box” and “gray-box” supplier integration in product development: Antecedents, consequences and the moderating role of firm size. *Journal of Operations Management*, *25*(4), pp.847-870.

Kraiczy, N. D., Hack, A., & Kellermanns, F. W. (2015). The relationship between top management team innovation orientation and firm growth: The mediating role of firm innovativeness. *International Journal of Innovation Management*, 19 (1), pp. 1-24.

Kramer, H.E., (1975). The philosophical foundation of management rediscovered. *Management International Review*, pp.47-54.

Krasnopolskaya, I. and Meijs, L. (2019) “The Effect of Enabling Factors on Social Innovation in Russian Non-Profit Organisations,” *International Journal of Sociology and Social Policy*, 39(5-6), pp. 447–463. doi: 10.1108/IJSSP-09-2018-0140.

Kuhn, T.S. (1962). The structure of scientific revolutions. Chicago Uni. Chicago Press. pp. 9-23.

Kumar, S. and Phrommathed, P., (2005). Basic Conceptual Model. *New Product Development: An Empirical Study of the Effects of Innovation Strategy, Organisation Learning, and Market Conditions*, pp.5-42.

Kuzel, A.J., (1992). Sampling in qualitative inquiry. pp. 45-69.

Kvale, S., (2007). Transcribing Interviews. pp. 39-74.

Lancker, J. V., Mondelaers, K., Wauters, E., & Huylenbroeck, G. V. (2016). The Organisational Innovation System: A systemic framework for radical innovation at the organisational level. *Technovation*, 52 (53), pp. 40-50.

Lauffer, A., (2011). Understanding your social agency. Sage Publications. pp. 60-94.

Laux, V., (2015). Executive Pay, Innovation, and Risk-Taking. *Journal of Economics & Management Strategy*, *24*(2), pp.275-305.

Leal-Rodríguez, A.L., Ariza-Montes, J.A., Roldán, J.L. and Leal-Millán, A.G., (2014). Absorptive capacity, innovation and cultural barriers: A conditional mediation model. *Journal of Business Research*, *67*(5), pp.763-768.

Lee, J., Veloso, F.M., Hounshell, D.A. and Rubin, E.S., (2010). Forcing technological change: a case of automobile emissions control technology development in the US. *Technovation*, *30*(4), pp.249-264.

Leiblein, M.J. and Madsen, T.L., (2009). Unbundling competitive heterogeneity: Incentive structures and capability influences on technological innovation. *Strategic Management Journal*, *30*(7), pp.711-735.

Leonard-Barton, D. and Deschamps, I., (1988). Managerial influence in the implementation of new technology. *Management science*, *34*(10), pp.1252-1265.

Leonard-Barton, D., (1995). A dual methodology for cases studies. *Longitudinal field research methods*, pp.38-64.

Levering, B., (2002). Concept analysis as empirical method. *International Journal of Qualitative Methods*, 1(1), pp.35-48.

Levin, D.M., (1988). Transpersonal phenomenology: The corporeal schema: Methodological Introduction. *The Humanistic Psychologist*, 16(2), pp.282-313.

Li, Q., Maggitti, P., Smith, K., & Tesluk, P. (2012). Top Management Attention to Innovation: The Role of Search Selection and Intensity in New Product Introductions. *Academy of Management Journal*. 56. pp. 893-916. 10.5465/amj.2010.0844.

Li, V., Mitchell, R., & Boyle, B. (2016). The divergent effects of transformational leadership on individual and team innovation. *Group & Organisation Management*, 41 (1), pp. 66-97.

Liao, S.H. and Wu, C.C., (2010). System perspective of knowledge management, organisational learning, and organisational innovation. *Expert systems with Applications*, *37*(2), pp.1096-1103.

Lin, R.J., Chen, R.H. and Chiu, K.K.S., (2010). Customer relationship management and innovation capability: an empirical study. *industrial Management & data Systems*. *8*(4). pp. 545-568.

Lin, Y., Tseng, M.L., Chen, C.C. and Chiu, A.S., (2011). Positioning strategic competitiveness of green business innovation capabilities using hybrid method. *Expert systems with applications*, *38*(3), pp.1839-1849.

Lin, Yini & Wu, Lei-Yu. (2014). Exploring the role of dynamic capabilities in firm performance under the resource-based view framework. *Journal of Business Research*. 67. pp. 407–413. 10.1016/j.jbusres.2012.12.019.

Lu, T.T. and Chen, J.C., (2010). Incremental or radical? A study of organisational innovation: An artificial world approach. *Expert Systems with Applications*, *37*(12), pp.8193-8200.

Maier, N.R.F., (1963). *Problem-solving discussions and conferences: Leadership methods and skills*. McGraw-Hill. pp. 7-54.

Mairesse, J. and Mohnen, P., (2002). Accounting for innovation and measuring innovativeness: an illustrative framework and an application. *American Economic Review*, 92(2), pp.226-230.

Mankin, E. (2007). Measuring innovation performance. *Research Technology Management*. 50. pp. 5-7.

Manoochehri, G., (2010). Measuring innovation: Challenges and best practices. *California Journal of Operations Management*, 8(1), pp.67-73.

Manual, O., 2005. Guidelines for collecting and interpreting innovation data (2005). *A joint publication of OECD and Eurostat, Organisation for Economic Co-Operation and Development. Statistical Office of the European Communities*. pp. 6-23.

Maravelakis, E., Bilalis, N., Antoniadis, A., Jones, K.A. and Moustakis, V., (2006). Measuring and benchmarking the innovativeness of SMEs: A three-dimensional fuzzy logic approach. *Production Planning & Control*, 17(3), pp.283-292.

Martinez-Ros, E., & Orfila-Sintes, F. (2009). Innovation activity in the hotel industry. *Technovation*, 29, pp. 632 - 641.

Mbassegue, P., Nogning, F.L. and Gardoni, M., (2015). A conceptual model to assess KM and innovation projects: a need for an unified framework. *In IFIP International Conference on Product Lifecycle Management,* pp. 444-458.

McDonald, R.E. (2007), “An investigation of innovation in nonprofit organisations: the role of organisational mission”, *Nonprofit and Voluntary Sector Quarterly*, 36(2), pp. 256-281.

McNamara, C., (2009). General guidelines for conducting research interviews. Retrieved May, 2, p.2013.

Mendie, P.J. and Ejesie, E., (2014). Logical Positivism versus Thomas Kuhn. THE LEAJON: *An Academic Journal of Interdisciplinary Studies*, 6(1), pp.197-216.

Mention, A.L., (2011). Co-operation and co-opetition as open innovation practices in the service sector: Which influence on innovation novelty?. *Technovation*, *31*(1), pp.44-53.

Miles, J. A. (2012). Management and Organisation Theory: A Jossey-Bass Reader. San Francisco: John Wiley & Sons, Inc. pp. 7-15.

Miles, MB. & Huberman, AM. (1994). Qualitative Data Analysis (2nd edition). Thousand Oaks, CA: Sage Publications. pp. 1-200.

Miles, M. B., Huberman, A. M. and Saldaña, J, (2014) *Qualitative Data Analysis : A Methods Sourcebook*. Third edn. Thousand Oaks, California: SAGE Publications. pp. 1-230.

Millson, M.R., (2015). Exploring the nonlinear impact of organisational integration on new product market success. *Journal of Product Innovation Management*, *32*(2), pp.279-289.

Mintzberg, H., Ghoshal, S., Lampel, J. and Quinn, J.B., (2003). The strategy process: concepts, contexts, cases. Pearson education. pp. 18-74.

Mirvis, P., Herrera, M.E.B., Googins, B. and Albareda, L., (2016). Corporate social innovation: How firms learn to innovate for the greater good. *Journal of Business Research*, *69*(11), pp.5014-5021.

Mohtar, R.H. (2015) "Opportunities and Challenges for Innovations in Qatar," *The Muslim world (Hartford)*, 105(1), pp.46–57.

Mol, M.J. and Birkinshaw, J., (2009). The sources of management innovation: When firms introduce new management practices. *Journal of business research*, *62*(12), pp.1269-1280.

Mom, T.J., Van Den Bosch, F.A. and Volberda, H.W., (2009). Understanding variation in managers' ambidexterity: Investigating direct and interaction effects of formal structural and personal coordination mechanisms. *Organisation Science*, *20*(4), pp.812-828.

Mone, M.A., McKinley, W. and Barker III, V.L., (1998). Organisational decline and innovation: A contingency framework. *Academy of management review*, *23*(1), pp.115-132.

Mohammad, A. Y., Aini, Y. N., & Kamal, E. M. (2014). Influences of Firm Size, Age and Sector on Innovation Behaviour of Construction Consultancy Services Organisations in Developing Countries. *Business Management Dynamics*, 4 (4), pp. 1- 09.

Morehouse, R. (2011). Beginning Interpretive Inquiry: A Stepby- Step Approach to Research and Evaluation. USA: Routledge. pp. 45-90.

Morse, J. M. (2000) 'Determining Sample Size', *Qualitative Health Research*, *10*(1), pp. 3–5. doi: 10.1177/104973200129118183.

Mueller, V., Rosenbusch, N., & Bausch, A. (2013). Success Patterns of Exploratory and Exploitative Innovation: A Meta-Analysis of the Influence of Institutional Factors. *Journal of Management*, 39 (6), pp.1606-1636.

Mulgan, Geoff & Tucker, Simon & Ali, Rushanara & Sanders, Ben. (2007). Social Innovation: What It Is, Why It Matters and How It Can Be Accelerated. Oxford, United Kingdom. pp. 17-89.

Mumford, M.D. and Licuanan, B., (2004). Leading for innovation: Conclusions, issues, and directions. *The leadership quarterly*, 15(1), pp.163-171.

Mumford, M.M, Kelsey, M. and Logan, W.,(2015). Leadership, creativity and innovation: An overview. pp. 8-39.

Newby, P. (2014). Research Methods for Education (Second ed.). Oxon: Routledge. pp. 3-68.

Nicholls, A. & Cho, A. H. (2006), “Social Entrepreneurship: The Structuration of a Field”, in A. Nicholls (Ed.), Social Entrepreneurship. New Models of Sustainable Change, Oxford University Press, Oxford, pp. 99-118

Nicoletti, B. (2015). Optimizing Innovation with the Lean and Digitize Innovation Process. *Technology Innovation Management Review*, 5 (3), pp. 29-38.

Nieves, J. (2016), “Outcomes of management innovation: an empirical analysis in the services industry”, *European Management Review*, Vol. 13 No. 2, pp. 125-136, doi: https://doi.org/10.1111/emre.12071

Nohria, N. and Gulati, R., (1996). Is slack good or bad for innovation?. *Academy of management Journal*, *39*(5), pp.1245-1264.

Nonaka, I., (1994). A dynamic theory of organisational knowledge creation. *Organisation science*, 5(1), pp.14-37.

Norton, D.P. and Kaplan, R., (1999). *The Balanced Scorecard: translating strategy into action*. London, UK: Institute for International Research. pp. 8-76.

Novelli, M, Schmitz, B & Spencer, T., (2006), 'Networks, clusters and innovation in tourism: a UK experience', *Tourism Management*, 27(6), pp. 1141-1152.

Núñez-Sánchez, R., Barge-Gil, A. and Modrego-Rico, A., (2012). Performance of knowledge interactions between public research centres and industrial firms in Spain: a project-level analysis. *The Journal of Technology Transfer*, *37*(3), pp.330-354.

O’Gorman, K., & MacIntosh, R. (2014). Research Methods for Business & Management: A Guide to Writing Your Dissertation. Oxford: Goodfellow Publishers Ltd. pp. 9-65.

O’Reilly, C.A. and Tushman, M.L., (2008). Ambidexterity as a dynamic capability: Resolving the innovator's dilemma. *Research in organisational behavior*, *28*, pp.185-206.

O'Connor, G. C., & Rice, M. P. (2001). Opportunity recognition and breakthrough innovation in large established firms. *California Management Review*, 43 (2), pp. 95- 116.

OECD, E., (2005). Oslo manual: Guidelines for collecting and interpreting innovation data. *Paris 2005, Sp*, *46*. pp. 1-34.

Ohly, S. and Fritz, C., (2010). Work characteristics, challenge appraisal, creativity, and proactive behavior: A multi-level study. *Journal of Organisational Behavior*, 31(4), pp.543-565.

O'leary, Z., (2004). The essential guide to doing research. Sage. pp. 8-75.

Osborn, A.F., (1963). Applied Imagination. New York: Sribner's. Orpen, C.(1990). Measuring support for organisational Innovation: A validity study. *Phychological Reports*, *67*, pp.417-418.

Owens, B. (2015) "Qatar Forges Ahead With Science Vision," *The Lancet (British edition)*, 385(9963), pp.101–102.

Overvest, B. M. and Veldman, J. (2008) "Managerial Incentives for Process Innovation," *Managerial and Decision Economics*, 29(7), pp. 539–545.

Ozer, M., (2005). What do we know about new product idea selection. Center for Innovation *Management Studies*. pp. 31-46.

Panne, G., Van Beers, C. and Kleinknecht, A., (2003). Success and failure of innovation: a literature review. *International Journal of Innovation Management*, *7*(03), pp.309-338.

Papadakis, V. and Bourantas, D., (1998). The chief executive officer as corporate champion of technological innovation: aii empirical investigation. *Technology Analysis & Strategic Management*, *10*(1), pp.89-110.

Payne, G. and Payne, J., (2004). Key concepts in social research. Sage. pp. 6-89.

Pearson, G.J., Pearson, A.W. and Ball, D.F., (1989). Innovation in a mature industry: A case study of warp knitting in the UK. *Technovation*, *9*(8), pp.657-679.

Peeters, C., & Potterie, B. V. (2006). Innovation strategy and the patenting behavior of firms. *Journal of Evolutionary Economics*, 16 (1), pp. 109-135.

Perri, B. (1993). Innovation by nonprofit organisations: Policy and research issues. Nonprofit Management and Leadership, Wiley. pp. 8-76.

Pestoff, V. A. (1992). Third sector and co-operative services—An alternative to privatization. *Journal of Consumer Policy*, 15(1). pp. 21–45.

Phills, J.A., Deiglmeier, K. and Miller, D.T., (2008). Rediscovering social innovation. *Stanford Social Innovation Review*, *6*(4), pp.34-43.

Plank, J. and Doblinger, C., (2018). The firm-level innovation impact of public R&D funding: Evidence from the German renewable energy sector. *Energy Policy*, 113, pp.430-438.

Podmetina, D., Volchek, D., Dąbrowska, J. and Fiegenbaum, I., (2013). Human resource practices and open innovation. *International Journal of Innovation Management*, *17*(06), p.1340019.

Podolny, J. M. and Hansen, M. (2020) “How Apple is Organized for Innovation,” *Harvard Business Review,* 98(6), pp. 86-95.

Porter, M.E., 1985. Value chain. *The Value Chain and Competitive advantage: creating and sustaining superior performance*. Wiley. pp. 5-47.

Porter, M.E., (1990). The competitive advantage of nations. *Harvard business review*, 68(2), pp.73-93.

Prajogo, D.I. and Ahmed, P.K., (2006). Relationships between innovation stimulus, innovation capacity, and innovation performance. *R&D Management*, *36*(5), pp.499-515.

Prajogo, D. I. and McDermott, C. M. (2011) “The Relationship between Multidimensional Organisational Culture and Performance,” *International Journal of Operations & Production Management*, 31(7), pp. 712–735. doi: 10.1108/01443571111144823.

Prange, C. and Pinho, J.C., (2017). How personal and organisational drivers impact on SME international performance: The mediating role of organisational innovation. *International Business Review*, 26(6), pp.1114-1123.

Priem, R.L. and Butler, J.E., (2001). Is the resource-based “view” a useful perspective for strategic management research?. *Academy of management review*, 26(1), pp.22-40.

Hukoomi., 2020. Qatar, Government., [Online] Available at: https://portal.www.gov.qa/wps/portal/topics/Education+and+Training/Higher+Education [Accessed 21 May 2020].

R. Balachandra and J. H. Friar, (1997). "Factors for success in R&D projects and new product innovation: a contextual framework," *IEEE Transactions on Engineering Management*, 44(3), pp. 276-287, doi: 10.1109/17.618169.

Ramirez, R., Roodhart, L. and Manders, W., (2011). How Shell’s domains link innovation and strategy. *Long Range Planning*, *44*(4), pp.250-270.

Rao, D. V. (ed.) (2018), *Critical humanities from india : contexts, issues, futures.* London: Taylor and Francis. pp. 8-75.

Reficco, E., Layrisse, F. and Barrios, A. (2020) “From Donation-Based Npo to Social Enterprise: A Journey of Transformation through Business-Model Innovation,” *Journal of Business Research*. pp. 400-417. doi: 10.1016/j.jbusres.2020.01.031.

Rego, A., Sousa, F., Pina e Cunha, M., Correia, A. and Saur-Amaral, I., (2007). Leader self-reported emotional intelligence and perceived employee creativity: An exploratory study. *Creativity and Innovation Management*, *16*(3), pp.250-264.

Rehman, A.A. and Alharthi, K., (2016). An introduction to research paradigms. *International Journal of Educational Investigations*, 3(8), pp.51-59.

Reichstein, T. and Salter, A., (2006). Investigating the sources of process innovation among UK manufacturing firms. *Industrial and Corporate change*, *15*(4), pp.653-682.

Rese, A., & Baier, D. (2011). Success factors for innovation management in networks of small and medium enterprises. *R&D Management*, 41 (2), pp. 138-155.

Rey-García, M., Calvo, N. and Mato-Santiso, V. (2019) "Collective Social Enterprises for Social Innovation," *Management Decision*, 57(6), pp. 1415–1440. doi: 10.1108/MD-01-2017-0091.

Richards, R. (2003). Character Individuation in Phylogenetic Inference. *Philosophy of Science.* 70. pp. 264-279. 10.1086/375467.

Rickards, T. and Freedman, B.L., (1978). Procedures For Managers In Idea-Deficient Situations: An Examination Of Brainstorming Approaches. *Journal of Management Studies*, *15*(1), pp.43-55.

Rickards, T., (1999). Brainstorming revisited: a question of context. *International journal of management reviews*, *1*(1), pp.91-110.

Ringov, D., (2017). Dynamic capabilities and firm performance. *Long Range Planning*, 50(5), pp.653-664.

Ritala, P., Olander, H., Michailova, S. and Husted, K., (2015). Knowledge sharing, knowledge leaking and relative innovation performance: An empirical study. *Technovation*, *35*, pp.22-31.

Ritchie, J.L. and Lewis, J., J. and Elam, G.(2003). Designing and Selecting Samples. Qualitative research practice. *A guide for social science students and researchers*, pp.77-108.

Rivas, R. and Gobeli, D.H., (2005). Accelerating innovation at Hewlett-Packard. *Research-Technology Management*, *48*(1), pp.32-39.

Rizova, P. (2006) "Are You Networked for Successful Innovation?," *MIT Sloan Management Review*, 47(3), pp. 49–55.

Roberts, P.W. and Amit, R., (2003). The dynamics of innovative activity and competitive advantage: The case of Australian retail banking, 1981 to 1995. *Organisation science*, *14*(2), pp.107-122.

Robson, C. and McCartan, K. (2015) *Real world research, 4th edition*. John Wiley & Sons. pp. 87-102.

Rogers, E.M. (2003). Diffusion of Innovations. Free Press: New York. pp. 9-86.

Rogers, M., (1998). The definition and measurement of innovation. *Melbourne Institute Working Paper,* 10(98). pp. 5-25.

Rynes, S. and Gephart, R. P. (2004) "From the Editors: Qualitative Research and the 'academy of Management Journal,'" *The Academy of Management Journal*, 47(4), pp. 454–462.

Romijn, H. and Albu, M., (2002). Innovation, networking and proximity: Lessons from small high technology firms in the UK. *Regional Studies*, 36(1), pp.81-86.

Roozenburg, N.F. and Eekels, J., (1995). Product design: fundamentals and methods. pp. 1-45.

Rosenbusch, N., Brinckmann, J. and Bausch, A., (2011). Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs. *Journal of business Venturing*, *26*(4), pp.441-457.

Rosing, K., Frese, M. and Bausch, A., (2011). Explaining the heterogeneity of the leadership-innovation relationship: Ambidextrous leadership. *The leadership quarterly*, *22*(5), pp.956-974.

Rothenberger, M. A. (2003) "Project-Level Reuse Factors: Drivers for Variation Within Software Development Environments*," *Decision Sciences*, 34(1), pp. 83–106. doi: 10.1111/1540-5915.02252.

Rothwell, R. (2007). Successful industrial innovation: Critical factors for the 1990's. *R&D Management*. 22. pp. 221 - 240. 10.1111/j.1467-9310.1992.tb00812.x.

Rowley, J., Baregheh, A. and Sambrook, S. (2011) "Towards an Innovation-Type Mapping Tool," *Management Decision*, 49(1), pp. 73–86. doi: 10.1108/00251741111094446.

Saemundsson, R. J., & Candi, M. (2014). Antecedents of Innovation Strategies in New Technology-based Firms: Interactions between the Environment and Founder Team Composition. *Journal of Product Innovation Management*, 31 (5), pp. 939-955.

Sahal, D., (1981). *Patterns of technological innovation* (Vol. 198, No. 1). Reading, MA: Addison-Wesley. pp. 5-48.

Salerno, M., Leonardo, S., Débora, B., and Raoni, S., (2015). Innovation processes: Which process for which project?. *Technovation*. 35. pp. 59-70. 10.1016/j.technovation.2014.07.012.

Salge, T.O. and Vera, A., (2013). Small steps that matter: incremental learning, slack resources and organisational performance. *British Journal of Management*, *24*(2), pp.156-173.

Sandberg, B. and Aarikka-Stenroos, L., (2014). What makes it so difficult? A systematic review on barriers to radical innovation. *Industrial Marketing Management*, *43*(8), pp.1293-1305.

Saunders, M., Lewis, P., & Thornhill, A. (2012). Research Methods for Business Students (6 ed.). Essex: Pearson Education Limited. pp.120-155.

Saunders, M., Lewis, P., & Thornhill, A. (2016). Research Methods for Business Students (Seventh ed.). Essex: Pearson Education Limited. pp. 1-120.

Schoonhoven, C.B., Eisenhardt, K.M. and Lyman, K., (1990). Speeding products to market: Waiting time to first product introduction in new firms. *Administrative Science Quarterly*, pp.177-207.

Schumpeter, J.A. (1934) "*The Theory of Economic Development*," Cambridge, MA, US: Harvard University Press. pp. 8-90.

Schumpeter, J., (1942). Creative destruction. *Capitalism, socialism and democracy*, *825*, pp.82-85.

Seaker, R. and Waller, M.A., (1996). Brainstorming. *International Journal of quality & reliability management*. pp. 6-18.

Shane, S.A. (2003) "*A General Theory of Entrepreneurship: The Individual- Opportunity Nexus*," Aldershot, UK: Edward Elgar. pp. 65-102.

Sharif, N., (2006). Emergence and development of the National Innovation Systems concept. *Research policy*, *35*(5), pp.745-766.

Sharir, M., & Lerner, M., (2006). Gauging the Success of Social Ventures Initiated by Individual Social Entrepreneurs. *Journal of World Business*. 41. pp. 6-20. 10.1016/j.jwb.2005.09.004.

Shenhar, A.J., Dvir, D., Levy, O. and Maltz, A.C., (2001). Project success: a multidimensional strategic concept. *Long range planning*, *34*(6), pp.699-725.

Shin, J. and G.E. McClomb, (1998). Top executive leadership and organisational strategy: An empirical investigation of nonprofit human service organisations (HSOs). *Administration Social Work*, 22. pp.1-21.

Silverman, D. (2000). Doing qualitative research: A practical handbook. London, Thousand Oaks, New Delhi: Sage. pp. 7-65.

Sirmon, D.G., Hitt, M.A. and Ireland, R.D., (2007). Managing firm resources in dynamic environments to create value: Looking inside the black box. *Academy of management review*, *32*(1), pp.273-292.

Smith, J. (1993). After the demise of empiricism: The problem of judging social and educational inquiry. New York: Ablex. pp. 8-17.

Smith, M., Busi, M., Ball, P. and Van der Meer, R., (2008). Factors influencing an organisation's ability to manage innovation: a structured literature review and conceptual model. *International Journal of innovation management*, *12*(04), pp.655-676.

Somekh, B. and Lewin, C. eds., (2005). Research methods in the social sciences. Sage. pp. 7-65.

Souder, W.E. and Moenaert, R.K., (1992). Integrating marketing and R&D project personnel within innovation projects: an information uncertainty model. *Journal of Management studies*, *29*(4), pp.485-512.

Sousa, F., Pellissier, R. and Monteiro, I.P., (2012). Creativity, innovation and collaborative organisations. *The International Journal of Organisational Innovation*, *5*(1), pp.26-64.

Souto, J.E., (2015). Business model innovation and business concept innovation as the context of incremental innovation and radical innovation. *Tourism Management*, *51*, pp.142-155.

Story, V.M., Daniels, K., Zolkiewski, J. and Dainty, A.R., (2014). The barriers and consequences of radical innovations: Introduction to the issue. *Industrial Marketing Management*, *43*(8), pp.1271-1277.

Sundbo, J., Orfila-Sintes, F. and Sørensen, F., (2007). The innovative behaviour of tourism firms—Comparative studies of Denmark and Spain. *Research policy*, *36*(1), pp.88-106.

Swanson, R. and Holton, E., (1997). Research Handbook: Linking research and practice. pp. 8-76.

Taghizadeh, S.K., Jayaraman, K.S., Ismail, I. and Rahman, S.A., (2014). Innovation value chain as predictors for innovation strategy in Malaysian telecommunication industry. *Problems and perspectives in management*, 12(4), pp.533-539.

Tallon, P.P., (2008). Inside the adaptive enterprise: an information technology capabilities perspective on business process agility. *Information technology and management*, 9(1), pp.21-36.

Tavassoli, S. and Karlsson, C., (2015). Firms' innovation strategies analyzed and explained. *Working Paper Series in Economics and Institutions of Innovation 396, Royal Institute of Technology, CESIS-Centre of Excellence for Science and Innovation Studies*, p.15.

Tawiah, P.A. and Russell, A.D., (2008). Assessing infrastructure project innovation potential as a function of procurement mode. *Journal of management in engineering*, *24*(3), pp.173-186.

Teece, D., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18, pp. 509-533.

Teece, D.J., (2014). A dynamic capabilities-based entrepreneurial theory of the multinational enterprise. *Journal of international business studies*, *45*(1), pp.8-37.

Teece, D. J. (2018) "Dynamic Capabilities As (workable) Management Systems Theory," *Journal of Management and Organisation*, 24(3), pp. 359–368. doi: 10.1017/jmo.2017.75.

Tellis, G.J., Prabhu, J.C. and Chandy, R.K., (2009). Radical innovation across nations: The preeminence of corporate culture. *Journal of marketing*, *73*(1), pp.3-23.

Thamhain, H.J., (2003). Managing innovative R&D teams. *R&d Management*, *33*(3), pp.297-311.

The World Bank., (2020). Qatar [Online] Available at: https://data.worldbank.org/country/qatar [Accessed 21 May 2020].

Thompson, R.F., (1967). Foundations of physiological psychology. pp. 7-89.

Thompson, V.A., (1965). Bureaucracy and innovation. *Administrative science quarterly*, pp.1-20.

Tidd, J., & Thuriaux-Aleman, B. (2016). Innovation management practices: cross- sectorial adoption, variation, and effectiveness. *R&D Management*, 46, pp.1024-1043.

Tidd, J., (2001). Innovation management in context: environment, organisation and performance. *International journal of management reviews*, *3*(3), pp.169-183.

Tikkanen, H. *et al.* (2005) "Managerial Cognition, Action and the Business Model of the Firm," *Management Decision*, 43(6), pp. 789–809.

Titus, P.A., (2000). Marketing and the creative problem-solving process. *Journal of Marketing Education*, *22*(3), pp.225-235.

Tiwana, A. (2008). Do Bridging Ties Complement Strong Ties? An Empirical Examination of Alliance Ambidexterity. *Strategic Management Journal*. 29. pp. 251 - 272. 10.1002/smj.666.

Todtling, F. and Grillitsch, M. (2015) "Does Combinatorial Knowledge Lead to a Better Innovation Performance of Firms?," *European planning studies*, 23(9), pp. 1741–1758.

Tohidi, H. (2012). The effects of motivation in education. *Procedia - Social and Behavioral Sciences.* 31. pp.820 – 824. 10.1016/j.sbspro.2011.12.148.

Totterdell, P., Leach, D., Birdi, K., Clegg, C. and Wall, T., (2002). An investigation of the contents and consequences of major organisational innovations. *International Journal of Innovation Management*, *6*(04), pp.343-368.

Tracy, S.J. (2013), Qualitative Research Methods. Wiley-Black Well, West Sussex. pp. 1-79.

Trott, P. (2012). Innovation Management and New Product Development (5 ed.). Essex: Pearson Education Limited. pp. 1-40.

Trott, P., (2005). Innovation management and product development. pp. 7-88.

Truijens, O., (2003). A Critical Review of the Resource-based View of the Firm. University of Amsterdam, Netherlands. *Sprouts: Working Papers on Information Systems*, 3(6), pp.3-6.

Tsoukas, H., & Knudsen, C. (2003). The Oxford Handbook of Organisation Theory: Meta-Theoretical Perspectives. Oxford: Oxford University Press. pp. 5-45.

Twiss, B.C., (1974). Developing and implementing a strategy for production. *Long Range Planning*, *7*(2), pp.31-38.

Ucar, E., (2018). Local creative culture and corporate innovation. *Journal of Business Research*, *91*, pp.60-70.

Unger, B.N., Kock, A., Gemünden, H.G. and Jonas, D., (2012). Enforcing strategic fit of project portfolios by project termination: An empirical study on senior management involvement. *International Journal of Project Management*, *30*(6), pp.675-685.

Valencia, J.C.N., Valle, R.S. and Jiménez, D.J., (2010). Organisational culture as determinant of product innovation. *European Journal of Innovation Management*, 13(4). pp. 466-480.

Van der Have, R.P. and Rubalcaba, L., (2016). Social innovation research: An emerging area of innovation studies?. *Research Policy*, *45*(9), pp.1923-1935.

Van Horne, C., Frayret, J.M. and Poulin, D., (2006). Creating value with innovation: From centre of expertise to the forest products industry. *Forest Policy and Economics*, *8*(7), pp.751-761.

Vicente, M., Abrantes José Luís and Teixeira Mário Sérgio (2015) “Measuring Innovation Capability in Exporting Firms: The Innovscale,” *International Marketing Review*, 32(1), pp. 29–51. doi: 10.1108/IMR-09-2013-0208.

Volberda, H. W., Van Den Bosch, F. A. J., & Mihalache, O. R. (2014). Advancing management innovation: Synthesizing processes, levels of analysis, and change agents. *Organisation Studies* 35(9), pp.1245-1264.

Walker, K. (2007). L. Sackney, & K. Walker (2007). Sustainable innovation in exemplary schools. *International Journal of Interdisciplinary Social Sciences*, 1, pp.1-10.

Walker, R.M., (2008). An empirical evaluation of innovation types and organisational and environmental characteristics: Towards a configuration framework. *Journal of public administration research and theory*, *18*(4), pp.591-615.

Walker, R.M., Chen, J. and Aravind, D., (2015). Management innovation and firm performance: An integration of research findings. *European Management Journal*, *33*(5), pp.407-422.

Wallace, J. C., Butts, M. M., Johnson, P. D., Stevens, F. G., & Smith, M. B. (2013). A Multilevel Model of Employee Innovation: Understanding the Effects of Regulatory Focus, Thriving, and Employee Involvement Climate. *Journal of Management*, 42 (4), pp. 982-1004.

Wang , C. L., & Rafiq, M. (2014). Ambidextrous organisational culture, contextual ambidexterity and new product innovation: A comparative study of UK and Chinese high-tech firms. *British Journal of Management*, 25, pp. 58-76.

Wang, L. and Li, J. (2017) "The Antecedents and Innovation Outcomes of Firms' Absorptive Capacity in Global Buyer-Supplier Relationships," *The Journal of Technology Transfer*, 42(6), pp. 1407–1430. doi: 10.1007/s10961-016-9513-4.

Wang, Z. and Wang, N., (2012). Knowledge sharing, innovation and firm performance. *Expert systems with applications*, *39*(10), pp.8899-8908.

Weerawardena, J., & Sullivan Mort, G., (2001). Learning, Innovation and Competitive Advantage in Not-for-Profit Aged Care Marketing: A Conceptual Model and Research Propositions. *Journal of Nonprofit & Public Sector Marketing*. 9 pp. 8-17. doi: 10.1300/J054v09n03_04.

Weerawardena, J., & Sullivan Mort, G., (2006). Investigating Social Entrepreneurship: A Multidimensional Model. *Journal of World Business*. 41. pp. 21-35. doi:10.1016/j.jwb.2005.09.001.

Welch, C. and Piekkari, R. (2017) "How Should We (not) Judge the 'quality' of Qualitative Research? A Re-Assessment of Current Evaluative Criteria in International Business," *Journal of World Business*, 52(5), pp. 714–725. doi: 10.1016/j.jwb.2017.05.007.

Wernerfelt, B. (1984). A Resource Based View of the Firm. *Strategic Management Journal*, 5, pp. 171–180.

West, M.A. and Farr, J.L. eds., (1990). *Innovation and creativity at work: Psychological and organisational strategies*. John Wiley. pp. 7-45.

Westover, J. H. and Wagner, J. (2010) “Helping Nonprofits Measure Up: A New Evaluation Approach to Help Npo's Reduce Poverty and Increase Economic Self-Reliance,” *International Journal of Management and Innovation*, 2(2), pp. 44–53.

Willis, J. W. (2007). Foundations of qualitative research: interpretive and critical approaches. London: Sage. pp. 8-49.

Wolfe, R.A., (1994). Organisational innovation: Review, critique and suggested research directions. *Journal of management studies,* 31(3), pp.405-431.

Wu, S., Wee, H. M., & Lee, S. B. (2016). Technical innovation vs. sustainability: A case study from the Taiwanese automobile industry. *Transportation Research Part D: Transport and Environment*, 48, pp. 20-30.

Yang, D. *et al.* (2020) “The Fit between Market Learning and Organisational Capabilities for Management Innovation,” *Industrial Marketing Management*, 86, pp. 223–232. doi: 10.1016/j.indmarman.2019.12.007.

Yanow, D., & Schwartz-Shea, P. (2011). Interpretive Approaches to Research Design: Concepts and Processes. Netherlands: Routledge. pp. 6-34.

Yaseen, S.G., Al-Janaydab, S. and Alc, N.A., (2018). Leadership Styles, Absorptive Capacity and Firm's Innovation. *International Journal of Knowledge Management (IJKM)*, *14*(3), pp.82-100.

Ye, J., Hao, B. and Patel, P.C., (2016). Orchestrating heterogeneous knowledge: The effects of internal and external knowledge heterogeneity on innovation performance. *IEEE Transactions on Engineering Management*, *63*(2), pp.165-176.

Yin, R. (1993), 'Applications of Case Study Research', Beverly Hills, CA, Sage. pp. 7-16.

Yin, R. K. (1989). Case study research: Design and methods. Applied Social Research Series, 5. London: Sage. pp. 5-43.

Yin, R.K. (1994), Case Study Research: Design and Methods, 2nd ed., Sage, Thousand Oaks, CA. pp. 8-65.

Yin, R.K., (2003). Case study research: Design and methods, 5., pp. 5-88.

Yokomizo, C.A., Pavani, C. and Sbragia, R., (2013). Assessing The Innovation Value Chain Of Companies In Sapucaí Valley: Unveiling Bottlenecks And Addressing Conducive Suggestions. York: McGraw-Hill Irwin. pp. 6- 54.

Yusof, N., & Shafiei, M. W. (2011). Factors Affecting Housing Developers' Readiness to Adopt Innovative Systems. *Housing Studies*, 26 (3), pp.369-384.

Zaltman, G., Duncan, R. and Holbek, J., (1973). *Innovations and organisations*. John Wiley & Sons. pp. 5-45.

Zhang, J. and Duan, Y., (2010). The impact of different types of market orientation on product innovation performance. *Management decision*. pp. 40-89.

Zhong, R., Northrop, J.K., Sahota, P.K., Glick, H.B. and Rostain, A.L., (2019). Informed about Informed Consent: A Qualitative Study of Ethics Education. *Online Journal of Health Ethics*, 15(2), p.2.

Zhou, K.Z. and Li, C.B., (2012). How knowledge affects radical innovation: Knowledge base, market knowledge acquisition, and internal knowledge sharing. *Strategic management journal*, *33*(9), pp.1090-1102.

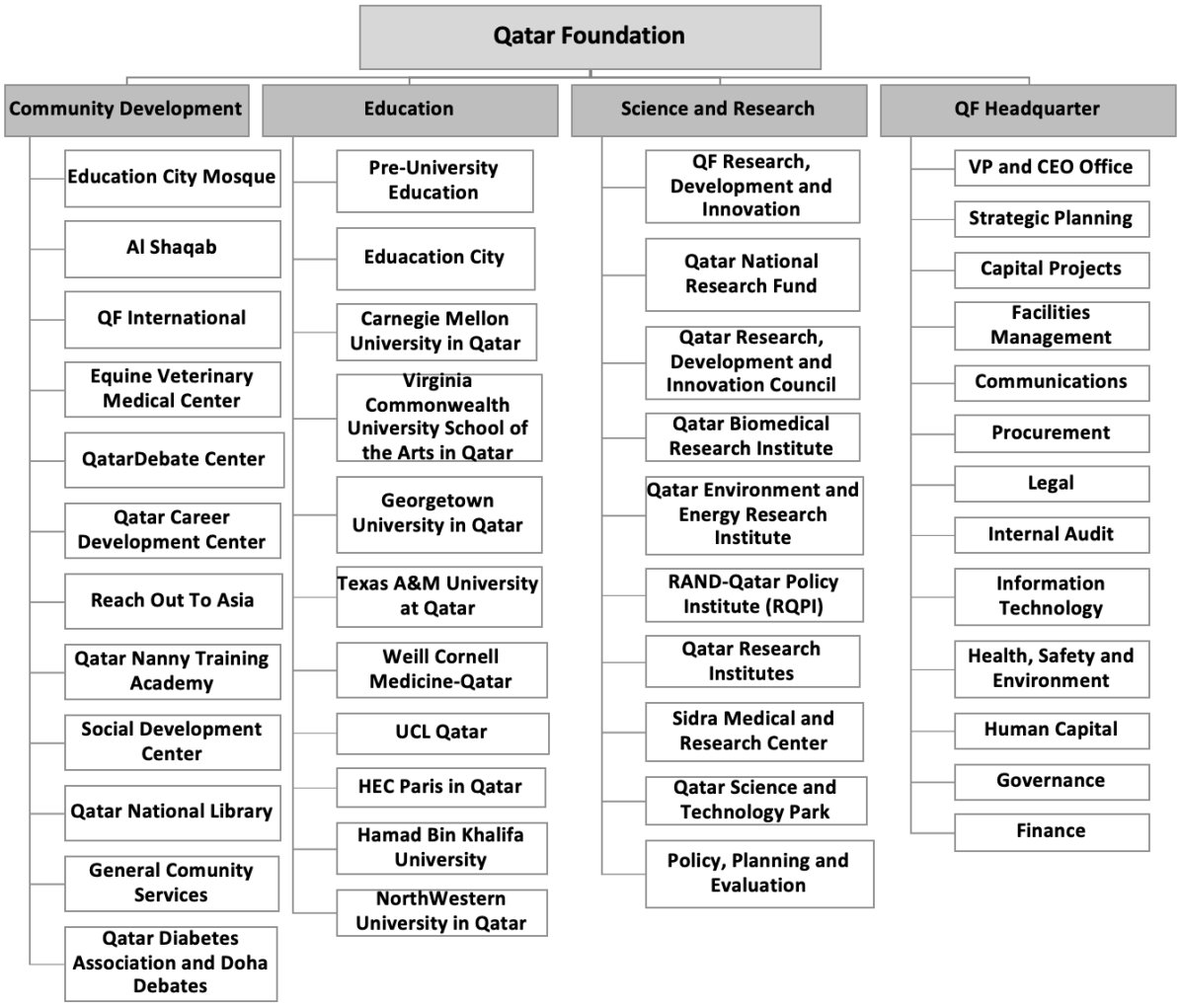
Zhou, Y., Hong, Y. and Liu, J., (2013). Internal commitment or external collaboration? The impact of human resource management systems on firm innovation and performance. *Human Resource Management*, *52*(2), pp.263-288.

Žukauskas, P., Vveinhardt, J. and Andriukaitienė, R., (2018). Philosophy and paradigm of scientific research. *Management Culture and Corporate Social Responsibility*, p.121.

Appendices

Appendix A

Organisational structure of the Qatar Foundation



Source: Qatar Foundation Portal (2020)

Appendix B

Participants Information Sheet

PARTICIPANT INFORMATION SHEET

Project Title:

The Antecedents of Successful and Impactful Innovation: The Case of the Qatar Foundation

Researcher

Khulood M. Balashwar

Invitation

You are being invited to take part in this research project. Before you decide to do so, please take time to read the following information carefully. If there is anything that you would like more information about please as me. Please take time to decide whether or not you wish to take part.

What is the project's purpose?

This research project intend to explore the different aspects of the innovation as it is conceptualised and operationalised in the mainstream management literature. In this regards, the aim of this study is to identify and analyse the different aspects of the antecedents of successful innovation, management process and outcomes of innovation. This analysis is useful in the sense that it builds a comprehensive knowledge base by problematizing and challenging the existing body of research and encourages the growth and diversity of research on innovation.

Do you have to take part?

Your participation in this project is entirely voluntary. You are not obliged to take part, you have been approached with a view that you might be interested in taking part, this does not mean you have to. If you do not wish to take part you do not have to give a reason and there will be no consequences. Similarly, if you do agree to participate and you wanted to withdrawal during the interview because you felt that you no longer want to participate in the study, you are free to do so. Also, if you wish to withdrawal after participating in the study please feel free to contact me on the email provided at the end of this sheet. Please note that you have one month after participation to withdrawal if you change your mind. In addition, if there is any question that you feel that you don't want to answer simply you don't have to. You are completely free to skip that question.

Will your participation in the project remain confidential?

If you agree to take part, your identity will be kept confidential and will not be recorded on the consent form, interview questionnaire or interview transcript. Also, the information will not be disclosed to other parties outside the research team, so only the research team will access the data. Any data collected in the interviews will be encrypted and stored it in University of Birmingham and will be protected by passwords and other relevant security processes and technologies. The physical data such as the consent sheets will be placed in files and will be kept in a secure locked drawer in the researcher's office.

Data collected may be shared in an anonymised form to allow use by the research team for PhD. thesis, publications, conferences etc. These anonymised data will not allow your identity to be identified by your employer or identifiable by any other party.

What will happen to the results of the research project?

Results of the research will be published in publications conferences etc. You will not be identified in any report or publication.

How long the interview is expected to last?

One interview lasting between one to three hours.

Contacts for further information

Khulood Balashwar,

Business School,

The University of Birmingham

Email: [redacted]

Lead Supervisor:

Pervez Ghauri

Professor of International Business

Business School – Strategy and International Business

0121 414 5868

[redacted]

Thank you for taking part in this research.

Appendix C

Consent Form for Participants

CONSENT FORM

Project Title:

The Antecedents of Successful and Impactful Innovation: The Case of the Qatar Foundation

Researcher

Khulood M. Balashwar

Lead Supervisor:

Pervez Ghauri

Professor of International Business

Business School – Strategy and International Business

[redacted]

[redacted]

Please Tick box

1. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason or prejudice. ☐

2. I agree to take part in the above study. ☐

Please Tick box

	No	Yes
3. I agree to the interview being audio recorded	☐	☐
4. I agree to the use of anonymised quotes in publications	☐	☐
5. I agree that my data gathered in this study may be stored (after it has been anonymised) in a specialist data centre and may be used for future research.	☐	☐

_____	_____
Name of Participant	Name of Researcher
_____	_____
Date	Date
_____	_____
Signature	Signature

Appendix D

Interview Questions

What is your functional area? …….

a. Senior Management
b. Mid-level Manager
c. Operational Staff
d. Scientist
e. Project Team Leader
f. Others

……

……

Section 1: Antecedents of Innovation

A) Firm Related Antecedents:

1. Do you think that the Qatar Foundation's vision and strategy influence your institute's projects? Why?
……

……

2. Can the organisational structure influence the innovation projects process in your institute and how? How does the structure of your institute influence the innovation project process? Is it top-down or bottom-up?
……

……

3. Do you think that the overall Qatar Foundation culture has an influence on the success of your institute's innovation projects and how? Or have your institute implemented it's own special culture that enables its projects success? Please explain
……

……

4. Please explain how your institute's culture looks like and how the management makes sure everybody share the same culture?

……

……

5. Do you think that the organisational / institutional competency and responsiveness (i.e. human resources, skills, knowledge, respond to changes etc.) impact the success of the projects? How?

……

……

B) Project Related Antecedents:

6. To what extend does the availability and allocation of resources such as financial and technological resources impact the success of innovation projects? Why?

a. High impact
b. Medium impact
c. Low impact
d. Irrelevant

……

……

7. Do you think that the nature of the innovation project or the type of innovation influence the resources allocated for each project?

……

……

8. Do you think being under time pressure would results in better outcomes or enable the success of the project? Why?

……

……

9. Do you think the management has a role in achieving successful innovation project? What role do you as a manager and other senior leadership and managers play in supporting innovation projects within your institute?
……

……

10. How actively involved has the institute's senior management been in its decision-making involvement, and "support from above" for the investment in potentially innovative ideas? Do QF's senior management involve or support?
……

……

11. Do you think the employees and teams have a role in achieving successful innovation? What role do they play?
……

……

12. How often does your institute involve its innovation teams with cross-functional representatives from other work teams, QF institutes/departments, and external parties? If so, in your opinion how could this practice enabled innovation success?
……

……

Section 2: Stages of Innovation

13. What are the key elements considered in your institute strategy for managing innovation projects? Please explain your choices.

a. Alignment with the overall organisation (QF) strategy

b. Collaboration between managers in projects related decision making
c. Being fitted with it's resources and competencies
d. All of the above

……

……

14. Does the institute' s higher management share its strategy and plans with the lower level employees and how? Do they consider the employees feedback?

……

……

15. How are you evaluating the extent to which a particular project aligns with and meets a particular strategic objective? Do you have a checklist to compare with when you evaluate?

……

……

16. How do you manage and organise the innovation project processes through out the project (X) life cycle? And do you think managing and organising the process would enable projects success? Can talk me through the project process stages

……

……

17. How are employees encouraged to be creative and innovative in bringing new projects ideas in your institute?

……

……

18. When project (X) started then implemented, was there a degree of freedom given to staff to define and execute their ideas? How?

……

……

19. Does your department/entity implement a planning and monitoring system of the staff progress related to the project? How does it work? Do you think such system enabled the project success?

……

……

20. Does your institute commits to continuous staff development i.e. training? Is this development linked to the project's needs? Please explain

……

……

21. Is the access to the knowledge and the knowledge sharing available within your institute? How?

……

……

22. Can you talk to me about the communication pattern among people within your entity? Do you have open or formal communication channels? Is there any transparency?

……

……

23. Does your institute have a network that enables collaborations and communications with external parties or other entities within QF? How does it work? Was it helpful?
……

……

24. What do you think of QF overall network between entities? How building a strong network system would help achieving innovation project success?
……

……

Section 3: Innovation Performance

25. How do you evaluate the success of an innovation project (X)?
……

……

26. What was the outcome of the project? Did it meet what you planned to achieve?

a. Introduce a new business practice
b. New methods of organising work responsibilities
c. New methods of organising decision-making
d. Social impact
e. Industry transformation
f. Other

27. How does innovation affect the effectiveness of your operations?
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