THE ROLE OF KNOWLEDGE CREATION PROCESS IN ENHANCING ORGANIZATIONAL RESILIENCE AND PERFORMANCE

A THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF

DOCTOR OF PHILOSOPHY

BY

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Certificate of Original Authorship

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

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Abstract

The banking industry has been widely plagued by global financial and economic crises despite its central role in the financial sustainability and economic life of a country. A series of deep economic reforms has been initiated to boost the productivity of the banking sector, particularly in developing countries; however, little certainty and agreement has yet to be seen with respect to the organisational performance and resilience of the banks in an ever-changing environment in these countries. The banking system may need to adopt an innovative approach in delivering efficient services while coping with environmental changes, such as global financial disorders.

The effective and efficient development, application and implementation of a knowledge management system and practices is believed to be key in the success of financial institutions, including the banking system, in the areas of operations, management, accounting and marketing.

Given this background, this study investigates the influence of knowledge creation and sharing processes (based on Nonaka and colleagues' SCEI model) on organisational resilience and performance. It explores the key role of the knowledge creation process (KCP) in enhancing organisational resilience capabilities including adaptability, agility, robustness and innovation. It also examines the mediating effect of organisational resilience on the relationship between the knowledge creation process and organisational performance in the Saudi Arabian banking system.

A correlational method, quantitative in nature, is employed to collect data in order to test the hypotheses and find the relationship between knowledge creation, organisational resilience, and organisational performance. The research design employed is the survey design in order to collect data on the views of the Saudi Arabian banking employees on issues related to the aforementioned concepts.

The correlation test and the structural equation modelling revealed that a significant and positive association exists between the knowledge creation process and overall organisational resilience. It was found that except for robustness, other capabilities of organisational resilience i.e. adaptability, agility and innovation are correlated positively and significantly with the knowledge creation process.

In addition, the current study shows a significant, direct and positive association between

the knowledge creation process and organisational performance. More specifically, statistically significant support was found for the effects of knowledge creation and sharing processes on

organisational performance in the framework of the four perspectives of the balanced score card (BSC) (i.e. financial perspective, internal business process, customer perspective, and learning and growth perspective). The relationship analysis also revealed a positive relationship between organisational resilience and organisational performance, including the four perspectives of BSC. The Structural Equation Modeling (SEM) showed that organisational resilience has a mediating effect on the relationship between the KCP and organisational performance in the Saudi banking sector.

For Saudi Arabian banks to remain resilient and maintain or sustain their performance, it is necessary for them to continue to enhance their ability in creating and sharing knowledge, and to invest in knowledge management infrastructure and technologies as it is still in its early stages.

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CHAPTER 1 : INTRODUCTION

The introduction chapter presents an overview of the topic and research background needed for this thesis, followed by the key issues related to the research aim and questions, the scopes, method and thesis layout. The chapter begins with a statement of the research problem, the presentation of the key concepts and the personal motivation for conducting this study, which leads to the purpose of the study including the research aim and questions. Following this, the significance of the study is presented. The chapter ends with an explanation and overview of the research method applied in the study, followed by an illustration of the thesis outline.

1.1   Statement of the Problem

The appropriate implementation of knowledge management has proved to be a valuable and powerful tool for organizations in order to gain an advantage over their competitors and to ensure their organization's ongoing existence; as a result, businesses and organizations must concentrate on their knowledge creation and sharing system to achieve a competitive advantage (DeNisi, Hitt & Jackson 2003; Moghaddam, Mosakhani & Aalabeiki 2013).

While there is no consensus over the precise definition of knowledge, researchers, professionals and knowledge workers often view knowledge as a multifaceted concept which goes beyond the definition of data and information and is interpreted differently by people within different contexts, and as such, it is argued that knowledge is contextual (Baghbanian 2011; Baghbanian, Torkfar & Baghbanian 2012). For some people, knowledge is defined as a justified true belief (Nonaka & Takeuchi 1995); however, others describe it as a combination of experience, values, contextual information and understanding which provides a framework for appraising new experiences and information (Davenport, De Long & Beers 1998; Davenport & Prusak 2000). Knowledge is positioned on a continuum of explicit and tacit knowledge each with its own features (Nonaka & Von Krogh 2009; Nonaka, Von Krogh & Voelpel 2006; Polanyi 1997).

It is widely acknowledged that knowledge should be properly managed to enhance learning, knowledge creation, transfer and integration (AL-Ghamdi 2013; Burford & Ferguson 2011; Burstein et al. 2010). Knowledge management is a process that entails

the creation, storage, allocation, acquisition, application, distribution and incorporation of knowledge in order to advance operational efficiency and organisational competitive advantage (Gichohi 2017; Lee & Buckthorpe 2008; Lytras, Naeve & Pouloudi 2005).

The application of knowledge management initiatives, for example, has been argued to drive financial institutions, including banks, to grow and move towards increasing business excellence (AlAmmary & Fung 2008; Rasoulinezhad 2011). Previous research has shown a strong association between knowledge creation processes and key organisational variables including organisational performance and resilience. It is demonstrated that the introduction of knowledge management practices in business settings has increased competition among companies which, in turn, leads to an increase in the number of strategies to enhance organisational performance and hence customer satisfaction (AlAmmary & Fung, 2008; Alrawi & Elkhatib, 2009; Rasoulinezhad, 2011) and resilience (Fani & Fard, 2015; Mafabi, Munene, & Ntayi, 2012; Umoh & Amah, 2013).

The concept of resilience, even though it has been defined from various perspectives to suit the range of contexts in which it has been applied, is closely related to the capability and ability of a system to return to a stable status after a disruption (Bhamra, Dani & Burnard 2011). According to Madni and Jackson (2009), resilience is a multi-faceted capability of a complex system that encompasses avoiding, absorbing, adapting to, and recovering from disruptions. It is the capacity of an organization to survive, adapt, and grow in the face of uncertain conditions (Bhamra, Dani & Burnard 2011; Lengnick-Hall, Beck & Lengnick-Hall 2011).

Similarly, the concept of organisational performance is an outcome of numerous factors that include corporate culture and image, group/team interaction and communication, work processes, leadership, polices, loyalty, and a climate that encourages creativity and innovation (Cho, 2011). Organisational performance is an outcome of numerous factors that include corporate culture and image, group/team interaction and communication, work processes, leadership, polices, loyalty, and a climate that encourages creativity and innovation (Cho, 2011). Organisational performance measures comprise both financial and non-financial performance measures. One of the leading measurement tools for organisational performance is the balanced scorecard, which includes both financial and non-financial measures (Kaplan & Norton, 1992).

The previous literature demonstrates that the alignment between knowledge strategy and business strategy clearly affects organisational performance (AlAmmary & Fung 2008). Rasoulinezhad (2011), for instance, argued that the cost of integrating knowledge management into an organisation's business strategy and investment in this area makes it crucial for banks to use the proper information and knowledge creation and sharing practices. AlAmmary & Fung (2008) also highlighted knowledge as a key element in the performance of the banking industry. The banking sector is thus recommended to dynamically integrate knowledge strategies into their practices in order to improve their performance and to be resilient to change. Knowledge management also forms the core of an organisation's compatibility, particularly in rapidly changing environments such as knowledge-intensive businesses (Fani & Fard 2015; Godwin & Amah 2013). Knowledge creation and knowledge sharing is a new strategic approach to continuous improvement and innovation (Mafabi, Munene & Ntayi 2012). It is at this interface that banks can better compete for their survival and create a larger market share.

Today's banking system however is not as robust and resilient as most people might assume, especially in developing countries. At times, the banking system lacks the tangible and intangible resources to make an efficient contribution to a community's economy, and sometimes the system might not be very developed, or might not be trusted, particularly in light of recent global recessions (Bahiti, Shkurti & Babasuli 2011; Bultum 2014; Cibils & Allami 2013; Claessens & Van Horen 2015).

The banking system may need to adopt an innovative approach to the delivery of efficient services while coping with environmental changes such as global financial disorders which can overcome, as much as possible, the ever-changing competitive and uncertain global environment. New approaches or strategies are required that can successfully produce and transfer knowledge, help in the management of skills and experience, and apply it in a way that enhances organisational performance and resilience (Baghbanian, 2011). Knowledge creation and knowledge sharing processes have been shown to be a key determinant of organisational performance, organisational resilience and competitive advantage in both the public and private sectors (Liu, Song & Cai 2014; Mafabi, Munene & Ntayi 2012; Mills & Smith 2011; Ramírez, Morales & Rojas 2011; Umoh & Amah 2013).

As the economy develops, knowledge management initiatives and the appropriate

implementation of knowledge creation processes are strongly believed to provide such a platform for the banking industry to move its system's performance forward and improve its resilience. Nonetheless, the banking industry has long been subject to debate in developing countries despite increased economic reforms (Hertog, 2013; Ramady, 2009; Sillah, khokhar, & Khan, 2014). Very little certainty and consensus exists around the performance, governance and resilience of the banking industry to change at global, national and local levels.

For many organisations, knowledge creation and knowledge sharing processes have become significant attributes of organisational success and they have essentially secured a visible position in the era of the competitive business environment. Knowledge management began as a corporate strategy for incorporating information and communication technologies into human resource practices in the pursuit of better organisational performance, improved learning and innovation as well as the efficient use of scarce resources, such as time and budget (Edwards, Collier & Shaw 2005; Thomas, Kellogg & Erickson 2001; Wang et al. 2016). The leading role of knowledge management in developing a culture of resilience has also been documented in many organisations (Akgün & Keskin 2014; Buliga, Scheiner & Voigt 2016; Singh 2014; Umoh & Amah 2013).

Some research scholars have suggested that knowledge management practices, knowledge infrastructure and processing are positively linked to organisational performance, and they have documented that knowledge management practices have a direct association with various intermediate measures of organisational performance and effectiveness (Gold, Malhotra & Segars 2001). Other researchers have argued that only dynamic business organisations which can adapt to the ever-changing environment and unexpected and uncertain circumstances can survive and thrive. Their investigations showed that a significant correlation exists between knowledge management and organisational resilience, stating that knowledge creation and sharing processes enhance organisational adaptation, resourcefulness and learning (Fani & Fard, 2015; Lengnick-Hall, Beck, & Lengnick-Hall, 2011; Mafabi et al., 2012; Umoh & Amah, 2013). Yet, despite the growing interest in knowledge management , very few financial institutions have succeeded in building a knowledge-based competence to gain and establish resilience.

A varied range of knowledge management theories and models has been proposed in the literature which business organisations and corporates can refer to in order to reinforce knowledge creation and sharing in relation to organisational performance and resilience (Nonaka, Von Krogh, & Voelpel, 2006); however little research exists on the role of these models and theories in improving organisational performance and resilience in the banking system. Nonaka and colleagues' (1995; 2000) theory of knowledge management is one of the leading theories in this area (Virtanen, 2011). It assumes that knowledge is created and shared through social interaction based on the four conversation processes where two types of knowledge i.e. explicit and tacit knowledge are converted or integrated in order to produce, combine, share and (re)produce new knowledge as outlined in Nonaka and colleagues' spiral knowledge creation and conversion mechanisms (the SECI model) (Nonaka, 1994; Nonaka & Takeuchi, 1995; Nonaka et al., 2000). The four modes of knowledge conversion include: socialization (from tacit knowledge to tacit knowledge), externalization (from tacit knowledge to explicit knowledge), combination (from explicit knowledge to explicit knowledge), and internalisation (from explicit knowledge to tacit knowledge). While the current literature has largely focused on Nonaka and colleagues' knowledge management within the context of business organisations, very little was found within the domain of the banking system. The application of Nonaka and Takeuchi's knowledge conversion theory has been very limited in the banking industry. What remains unclear is whether or not and how Nonaka and Takeuchi's knowledge conversion theory is employed in the Saudi Arabian baking sector to improve its performance and resilience in practice.

Darroch (2005) argued that business organisations are required to produce knowledge and manage it appropriately as a shared asset if they are to remain competitive, innovative and resilient, and to achieve enriched performance and favorable outcomes. Such an approach proposes knowledge creation as a strong source of organisational resilience and a key element in integrating innovation into business strategy, in integrating robustness and resilience in change and in delivering superior business performance. While a considerable number of studies have already recognized the relationship between knowledge creation processes and organisational performance and organisational resilience (Alrawi & Elkhatib, 2009; Byukusenge, Munene, & Orobia, 2016; H.-Y. Lee & Roth, 2008), almost all of them have been carried out primarily outside the domain of banking industry and also outside Saudi Arabia Many of the

published studies on the association between knowledge management and organisational variables explore only isolated single factors.

The present empirical research, to the best of our knowledge, represents the first attempt to investigate the association between knowledge management and both organisational performance and organisational resilience in the Saudi Arabian banking system. While a considerable number of studies exists that focus highly on the efficiency of the banking sector, to the researcher's best knowledge, only a few studies were carried out in developing countries. The majority have been conducted in developed countries, with particular emphasis on the banking sector in the United States. However, studies focused on the banks knowledge management in the Middle East countries are very limited, and there is very limited research in the Arab countries, especially in Saudi Arabia. Therefore, this study will try to fill the gap in the literature. In addition, contrary to the previous literature, this research study aims to investigate the mediating role of organisational resilience in the relationships between the knowledge creation process and organisational performance through a single study in the banking industry in Saudi Arabia, where a lack of relevant research is observed.

1.2   Purpose of the Study: Research Aims and Questions

The primary purpose of this empirical research is to ascertain the relationship between the knowledge creation process, organisational performance and organisational resilience within the Saudi Arabian banking industry. It aims to fill the gap in the previous literature by examining whether or not Nonaka and colleagues' knowledge creation processes (through the SCEI model) contribute to organisational performance and resilience in the Saudi Arabian banking system, and which factors will combine with knowledge management to enhance the business performance of the banking organizations within an emerging market in this country. In particular, the aim of this study will be achieved by formulating the following key hypotheses and research questions to address the research gaps identified in the current body of knowledge:

RQ1) How does the knowledge creation process (KCP) contribute to organisational resilience in the Saudi banking sector?

> H1) There is a positive relationship between the knowledge creation process and organisational resilience.

RQ2) How does organisational resilience contribute to organisational performance in the Saudi banking sector?

> H2) There is a positive relationship between organisational resilience and organisational performance.

RQ3) How does the KCP contribute to organisational performance in the Saudi banking sector?

> H2) There is a positive relationship between the knowledge creation process and organisational performance.

RQ4) What is the mediating effect of organisational resilience in the relationship between the KCP and organisational performance in the Saudi banking sector?

> H4) Organisational resilience mediates the relationship between the knowledge creation process and organisational performance.

1.3   Significance of the Study

Knowledge management and its appropriate implementation is becoming increasingly important as organizations continue to grow, face challenges and realise that creating value and a sustainable competitive advantage hinges on the successful management of their knowledge assets (Garbarino-Alberti & Pastorino 2014; Kulkarni & Freeze 2004; O'Leary & Studer 2001). The effect of knowledge management on an organisation's outcome measures, including knowledge creation and sharing processes, has been widely documented. In particular, its contribution to the development of an organisation, innovation management in companies and to organisational performance and robustness has been widely recognised/acknowledged in the literature (Andreeva & Kianto 2012; Soon 2015). Nonaka and colleagues' knowledge conversion model/theory is a dominant knowledge creation and sharing theory that has played a key role in these phenomena (Nonaka, 2006).

Previous studies have demonstrated that enriched organisational performance and organisational resilience often needs the appropriate implementation of knowledge management practices (Duffy 2000; Fani & Fard 2015; Fani, Fard & Yakhkeshi; Godwin & Amah 2013; Niu 2010; Mafabi, Munene & Ntayi 2012). This empirical research study argues that Nonaka and colleagues' knowledge creation and sharing processes (i.e. SCEI framework) have the potential to influence the Saudi-Arabian banking system's intention to improve its performance and resilience to change. Like many countries across the

world, the Saudi Arabian government has developed or adopted strategies to strengthen its knowledge management initiatives in practice in order to successfully create and share knowledge in a move towards improved organisational performance and resilience. This research study introduces a conceptual model featuring three exceptional constructs, with each construct signifying a single theoretical variable of interest i.e. knowledge creation processes, organisational performance with its dimensions and organisational resilience with its dimensions. No existing research, to the best of our knowledge, was found that has investigated the relationship between these constructs within the banking sector of a developing country like Saudi Arabia.

Saudi Arabia with its open door for foreign investment and international share market, Saudi Arabia Monetary Authority (SAMA) regulatory environment and Financial Sector Assessment Program (FSAP) in place has gain prominence amongst many developing countries. Such programs and authorities have helped Saudi Arabia identify major sources of systemic risk in its financial sector and implement policies that aim to enhance its resilience to any shockwaves and contagion (Fund 2017). Studying Saudi Arabian banking system with its unique characteristics would enable us to make specific claims in theory development and contributions to new knowledge.

This study provides significant data and background information to address the current gap identified in the existing knowledge. It makes a substantial contribution to knowledge management research as well as organisational performance and organisational resilience, and provides significant support to verify the effectiveness of knowledge creation processes to improve organisational performance and resilience. The results from this study and the interrelationships depicting the influence of knowledge creation on other study variables are expected to assist academics and decision-makers in targeting knowledge resources, improving organisation profitability, and confirming that knowledge management can improve the organisational performance and resilience within the banking industry.

A list of recommendations for future studies and implications for theory and practice are provided at the end. The recommendations also assist in the more effective use of knowledge creation processes to reinforce performance and facilitate resilience in Saudi Arabian organisations.

1.4   Research Method Overview

The present research study applies a correlational method, quantitative in nature, to collect data in order to test the hypotheses and find the relationships (or covariation) between two or more quantitative variables from the same group of respondents (Trochim & Donnelly 2001). From a different angle, the study is a non-experimental cross-sectional one where the data are collected at one point in time (one time survey) in order to compare the differences between the responses (Belli 2008). The research design employed is the survey design (De Vaus 2001). The researcher's intention was to collect data on the views of Saudi Arabian banking employees on issues related to knowledge creation, organisational resilience, and organisational performance at one point in time, making the survey design the most suitable.

The first stage of the present study is to conduct a literature review on the areas of organisational resilience, organisational performance and knowledge management in order to identify the research gap.

Following the identification of the research gap, the research aim, questions and hypotheses were developed, followed by modelling the concepts. After developing a research model, a survey data collection instrument was developed in order to collect quantitative data from the employees working at the Saudi Arabian banks. The instrument was designed based on the information obtained and was revised from the previous validated measures. Following the receipt of research ethics approval and completing the data collection, the data were analysed using appropriate statistical analyses, such as structural equation modelling (SEM) statistical techniques in order to examine the relationships between the different variables of the study. Finally, the research findings were interpreted within the current body of knowledge to understand their implications for research and practice.

1.5   Research Scope

The case study to be explored in this research includes the financial institutes i.e. banks within Saudi Arabia. The prime reason for selecting Saudi Arabia is the accessibility and convenience of the banking industry which employs a unique population of experts who have welcomed the need to adapt to changes rooted in knowledge management initiatives in order to improve its performance. The study was conducted with the following

limitations:

1) the study is limited to the banking sector of Saudi Arabia;
2) it examines the view/perspective of the banking staff about the contribution of knowledge management to organisational performance and resilience;
3) it employs the SCEI model as the most applicable theoretical knowledge creation/conversion model to examine the influence of knowledge creation processes on organisational performance and resilience;
4) the study is limited to banking employees' self-reports.

1.6   Thesis Structure

This thesis consists of six chapters. The first chapter introduces the research study by describing the problem statement, key concepts, the purpose of the study including the research aims and questions. The chapter also introduces the significance of the study, an overview of the research method, the scope and the thesis outline.

Chapter 2 presents a critical review of the existing literature related to knowledge and knowledge management; organisational performance and its dimensions of learning and growth; internal business processes; the customer perspective and the financial perspective; organisational resilience and its dimensions of innovation, agility, adaptability, and robustness. The review provides a theoretical foundation for the key concepts applied to conduct of the current study.

Chapter 3 further explains and predicts the relationship between the key concepts and constructs in order to develop the study's theoretical framework and presents the construction of the conceptual model based on the knowledge gaps revealed in the literature review. The chapter outlines the formulation of the research questions as a response to the identified research gaps. The feasibility of the constructs employed in the model is described, followed by the development of the research hypotheses.

Chapter 4 explains the research methodology used in the study, including the study design, the instruments applied, the population and the sample. The process of data collection is highlighted followed by a discussion of the data analysis procedure. The chapter also details the assessment of the measurement and structural model validity for hypotheses testing.

Chapter 5 presents the findings of the study including the participants' demographic information, the descriptive statistics and the specific findings related to the study.

Chapter 6 discusses the results and findings of the study in order to address the research questions. The study contribution is presented followed by the theoretical and practical implications of the study. This chapter ends by identifying the study's limitations and directions for future research. Throughout, some of the interpretations are described. Subsequently, the reference list and appendices are provided.

CHAPTER 2 : LITERATURE REVIEW

Chapter two provides a background on knowledge-related concepts, knowledge management, and knowledge creation and processes that might influence organisational resilience and performance as well as the implementation of evidence into practice. The existing literature is reviewed to ascertain whether there is any evidence of knowledge management practices associated with performance and resilience in organizations, to examine the degree to which the available evidence supports each of the study hypotheses, and to explore what is missing from the literature. The chapter introduces knowledge management initiatives, models, theories and best practices that later might be used in the construction of a conceptual framework for the study. The newly published studies on the association of knowledge management with organisational resilience and performance will be reviewed throughout the chapter, with a focus on the Saudi Arabian context.

2.1 Knowledge Management

2.1.1 Definition of Knowledge

The ability to achieve, use, create and share knowledge constitutes a feature that distinguishes human beings from other creatures. Research scholars and knowledge workers have adopted a range of homogenous and pluralistic perspectives in working out the definition of knowledge. An early definition of knowledge dates back to the Greek era when philosophers tried to devise a common definition of knowledge, in spite of several epistemological debates around the definition. Generally speaking, knowledge may be described as something that is known. Webster's dictionary (1996) defined knowledge in different ways: i) the state, fact, or act of knowing including a) familiarity or acquaintance with a place or fact, b) awareness and c) understanding; ii) acquaintance with accurate information, a wide variety of information, understanding, or awareness; iii) all that which has been grasped or perceived mentally, learning, enlightenment, and iv) the body for principles and facts acquired by mankind. Others have defined knowledge as intangible, unsolidified, personal, subtle, invisible, endless, and ever evolving (Firestone et al. 2005). As confirmed by Nonaka (1994), knowledge is a multifaceted and complex concept with various meanings (Nonaka 1994).

From a pluralistic perspective, Alavi & Leidner (2001) described knowledge as a condition of having access to information, capability, process, object and a "state of mind" for obtaining information. They argued that knowledge would allow people to expand their learning and apply it to satisfy their needs. It can be classified into two different domains: i) a state of understanding gained through an education system or experience; and ii) the sum of the range of what (concepts) has been discovered, perceived or learned (p.110). Knowledge may be considered as a thing, meaning that it could be modified and stored; it may be viewed as a process implying that understanding and acting may occur concurrently, which might entail the application of expertise; it might be considered as a condition of having access to information which, in this sense, may serve as an expanded view of knowledge as an object, particularly when the focus is on knowledge accessibility; and finally, knowledge may be perceived as a competence, signifying that it is has the potential to influence other current and future activities. The authors Alavi and Leidner (2001) however noticed there might be a less actionable capability in knowledge itself if it is not interpreted appropriately by the receivers; reflecting that such a knowledge has less potential to promote the utilisation and interpretation of other data and information, thus impeding decision-making processes. Yet, for many scholars, knowledge is considered to be highly personalized, and because of this, for individual and group knowledge to be constructive for others, it needs to be altered in ways that can enhance the receivers' interpretation.

Similarly, Collison & Parcell (2007) adopted a pluralistic perspective in defining the term knowledge and stated that knowledge is a combination of know-how, know-when, know-where, know-who (communication), know-what (facts) and know-why (science). Know-how is a widely accepted definition of knowledge; know-how entails the tools, techniques, procedures and processed applied to do something; know-why refers to an individual or group's ability see the big picture including insight linked to the context and value; know-what refers to understanding a certain fact or information which is required before arriving at an appropriate decision or accomplishing an activity properly; and know-who is related to social networks, contacts, and relationships through which individuals interact to help each other, a kind of knowledge that is created dynamically on the ground of interactions between and among the individuals and groups within an organisation (Nonaka, Toyama & Konno 2000); and know where relates to the individuals' ability to navigate through different situations in order to find the

information relevant to their needs, specifically a "human search engine." Due to the growth of information and communication technologies, including the World Wide Web and the Internet, this kind of knowledge is given much emphasis in present-day organisations, as it plays a crucial role in tracing the correct knowledge without any delay, and is not slowed down by information overload. Finally, know-when signifies an understanding of the most appropriate time of doing or stopping something e.g. making a decision. Such a definition suggests that information becomes knowledge when it is placed in context, presented to the right person at the correct time and location, with appropriate means and procedures considering the whole picture.

2.1.2 Knowledge as a competitive resource within organizations

The interest in knowledge management began by recognising knowledge as a competitive advantage that requires innovative management principles to create evolution and change to cause business growth. Knowledge as such might be considered a critical strategic asset, the ability to acquire, incorporate, store, share, assimilate, and to apply it, and a particular capability that drives both competitive advantage and the sustainability of the competitive advantage (Zack, 2002). However, it has been argued that knowledge may not always be viewed as a competitive edge for organisations. For organizations to ensure the competitive advantage and sustainability of their knowledge, this must be unique and exclusive to them so that their knowledge can be used and reused to gain a competitive edge over their competitors (Desouza & Vanapalli 2005; Evaristo 2005). From a business strategic perspective, in addition to its common taxonomy, knowledge may be classified into the three categories of core, advanced and innovative, depending on its ability to support an organisation's competitiveness (Zack 2002). Core knowledge allows one to run an organisation with minimum scope. It is shared commonly amongst members of the same organisation and cannot be utilized to affirm a long-term competitive edge. Even though organisations within the same industry may share similar levels and types of core knowledge, each entity has different kinds of core knowledge, as knowledge is contextual, triggered by need and is dependent of the norms, routines, culture and processes that govern organisations (Pauleen, Wu & Dexter 2007). Advanced knowledge is a distinct and differentiated type of knowledge that helps organisations establish superiority over their competitors. Lastly, innovative knowledge enables an organization to be a leader in its industry and distinguishes it from its rivals.

It enables the company to change the rules that govern the organisation, but due to the dynamic nature of knowledge, innovative knowledge eventually transforms into core knowledge. It is therefore imperative that members of an organisation continually acquire knowledge in order to maintain their competitive advantage and sustain a superior competitive position compared to other organisations in the same industry (Zack 1999).

2.1.3   The hierarchical view of a knowledge system: data, information and knowledge

Some scholars addressed the question of defining knowledge by distinguishing it from data and information. The Greeks were the first to distinguish information from knowledge, even though the terms were utilized differently. Plato and Socrates (Müller-Merbach 2004) first applied the terms 'written' 'actual' speech. Actual speech is an interactive, live dialogue where participants answer, ask, and react to questions, and attempt to convince one another, based on actual passion, engagement, conviction and consciousness which may be regarded as knowledge. However, written speech does not offer an interaction opportunity in most cases. It is usually passive and may be termed as information. In the contemporary definition, information represents useful or meaningful data that has been processed, condensed, modified, calculated, classified or contextualized. Vance (1997) clarified that information constitutes data that is interpreted into useful/meaningful frameworks, whereas knowledge is regarded as information that has been verified/authenticated and is considered factual.

An overview of the definitions of data, information and knowledge reveals that the differentiations amongst them are critical because they help researchers and policy-makers understand that sharing and creating knowledge are interpretive, interdependent and socio-cultural activities rather than merely acquiring and exchanging information. There is a common view amongst researchers that information is transformed/converted into knowledge after being processed in individuals' minds, whereas knowledge is converted into information after articulation in "formal language", e.g. as words, graphics, text, and other symbolic types (Alavi & Leidner 2001; Weiss & Prusak 2006).

From a conventional point of view, knowledge originates from data and consists of certain figures and facts. The data becomes information when it is organized in a certain context and, when judgments and experiences are included in the mix, it is transformed

into knowledge (Milam 2006). From this traditional perspective, knowledge is viewed through a hierarchical model, with knowledge forming the top, information in the middle, and data at the bottom (Pauleen 2007). Zack (1999) however proposed an inverted pyramid for the relationship between knowledge, information and data, proposing that it is not possible to interpret data and create information without any prior knowledge. Most often, knowledge is obtained through the interpretation of certain events or facts according to previously learned background knowledge. These facts or events may be unnoticed or discarded without prior knowledge or sufficient attention.

A holistic perspective has been adopted by several scholars, illustrating a recursive framework of data, information, and knowledge that synthesized both the conventional and reverse hierarchical models (Pauleen 2007). Pauleen (2007) stressed that the most useful and meaningful conceptual framework within which to view and clarify the relationships amongst data, information, knowledge and learning entails visualizing a hermeneutic, recursive process whereby each is modified, enriched and made useful through the consideration of others (Mason 2003; Pauleen, Wu & Dexter 2007).

Generally, for many, information contains facts, whereas knowledge tends to be more subjective, focusing on relationships or links (Hauschild, Licht & Stein 2001). Several scholars argue that information becomes knowledge after being processed in people's minds (Alavi & Leidner 2001), highlighting that knowledge is information that can be understood by people, and it has a relationship with judgments, observations, ideas, interpretations, concepts, procedures, and facts. Each person may understand knowledge in a different way predominantly because they may incorporate a unique set of prejudices and experiences to its use, value and meaning while making decisions (Hauschild, Licht & Stein 2001). However, not all sets of information may become knowledge. When a person does not understand the contextual meaning of the information, it means the information does not convert to knowledge and remains the same (Cohen 1977). Conversely, knowledge may be transformed into information if it is articulated and expressed through symbolic forms, words, graphics, numbers or text.

Others have observed information a particular instance, whereas knowledge to them refers to an understanding of the domain or functions codified in diagrams, recipes, insights, equations, templates, models, principles and other abstractions (Lang 1999). In this instance, only information that is relevant to and consistent with knowledge is

employed and inapt information will be discarded. Knowledge may be utilized again with various sets of appropriate information in other situations. For instance, when one understands a particular mathematical equation for a specific problem, s/he can use that knowledge and understanding in relation to future similar problems. In view of this condition, it is realistic if we assume that knowledge is reusable in different contexts/from one context to another. While access to a high volume of information may have little value and could be redundant, it becomes meaningful when people actively acquire it through a dynamic process of learning, enlightenment or reflection (Alavi & Leidner 2001).

Davenport et al. (1998, p.43) affirmed that knowledge is the information that has been combined with experience, interpretation, reflection and context.

2.1.4   Tacit versus explicit knowledge

Knowledge has been also differentiated and classified into the two modes of tacit and explicit based on its expression (Chou & He 2004; Frappaolo 2008; Noe 2002; Nonaka 2002; Nonaka, Toyama & Konno 2000). Knowledge that encompasses personal values, instincts, feelings, intuitions, insights, perspectives, beliefs, skills, know-how, experience as well as creative processes and an understanding a future state may be called tacit knowledge (Dyck et al. 2005; Frappaolo 2008; Sabherwal & Sabherwal 2007). Noe (2002) described tacit knowledge as the personal knowledge rooted in individual experiences that is influenced by values and perceptions (p.167).   Nonaka also stressed that tacit knowledge is deeply entrenched in action, commitment and engagement in a particular context (1994, p.16), and added that it may encompass technical and cognitive elements. The cognitive elements consist of personal views, beliefs, paradigms and schemata which allow people to build their perspectives to understand and define their environment. In contrast, the technical elements involve skills, techniques, articrafts and concrete know-how which is applicable to particular contexts (Nonaka 1994, p. 16).

Expanding on Nonaka's work (1994) on tacit knowledge, Pauleen (2007) and Manson (2003) argued that tacit knowledge also encompasses concepts of facts and values that are commonly known and understood to a group or society, often referred to as common sense which is usually created and transferred via apprenticeships and the broader cultural setting. The authors stressed that the culture and norms of an ethnic group or community can affect the creation of tacit knowledge and as soon as such knowledge is

constructed, it may not be changed easily. People who share little or no common facts or values may find it challenging to stabilize the 'analogue' process which results in shared tacit knowledge. In general, formalizing, expressing and articulating tacit knowledge to others is difficult, and, thus, its transmission usually occurs through subtle and informal means (Dyck et al. 2005; Sabherwal & Sabherwal 2007).Tacit knowledge is under continual transformation, i.e. it is continually changing and evolving since it exists in an individual's mind (Rowley 2001).

Explicit knowledge, also known as codified or visualized knowledge, is knowledge that can be transmitted in a systematic manner and through formal language in written or verbal form (Nonaka 1994, 2007; Nonaka, Von Krogh & Voelpel 2006; Weiss & Prusak 2006). It is often expressed in clear language formatted in the minds of individuals, reflecting that it can be stored or archived in a knowledge database or managed through a knowledge management system (de Carvalho 2001; Noe 2002). Explicit knowledge is commonly known as information (Frappaolo 2008). It is ready for transmission to others through synchronous and asynchronous means (Frappaolo 2008; Nonaka 2007). Often, explicit knowledge comprises procedure manuals, computer codes, diagrams, pictures and words and so on, so it can be transmitted to others in evident and formal ways (Dyck et al. 2005).

Even though explicit knowledge is denoted in symbolized and articulated forms, which may be shared, it may embody diverse meanings to diverse individuals or groups of people with different purposes (Weiss & Prusak 2006). When individuals convert explicit knowledge into tacit knowledge, they tend to come up with its interpretation based on their own specific purposes. For instance, even though explicit knowledge comprises different types of information, people may accept or reject it, reorganize, readjust and interpret some or all depending on their purposes, interests and needs (Weiss & Prusak 2006). However, the two states of knowledge are mutually interrelated and reinforce each other's qualities. Tacit knowledge creates the appropriate background for allocating the structures used in the development and interpretation of explicit knowledge. Yet, although both tacit and explicit knowledge are critical, tacit knowledge is capable of adding significant value to organisations as it is more complex to obtain, diffuse and manage (Frappaolo 2008). Many companies believe that tacit knowledge presents a complexity in terms of management compared to explicit knowledge; however, tacit knowledge is considered the most valuable (Hauschild, Licht & Stein

2001). Knowledge management should acquire and manage tacit knowledge that exists in individuals' mind, in addition to its explicit knowledge, as tacit knowledge could be essentially pertinent and useful to organisations when it is transformed to explicit knowledge and shared amongst people (Frappaolo 2008).

2.1.5 Definitions of Knowledge Management

No single definition of knowledge management exists. Since the inception of knowledge management in the early 1900s and the initiation of its theoretical background in business and management sciences, its definition has elicited heated debate amongst scholars and practitioners. Although knowledge management might be considered a framework or system that encompasses elements of culture, procedures and processes that are utilized in an attempt to manage valuable knowledge and corporation assets, a single definition for knowledge management is non-existent (Desouza 2005; Firestone et al. 2005). Indeed, defining and measuring knowledge management is difficult as it is process-oriented, multi-dimensional and complicated (Firestone et al. 2005; Iftikhar, Eriksson & Dickson 2003; Kumar & Thondikulam 2005). Because knowledge is mainly characterized by dynamism and constant change, knowledge management is also under continuous change in reaction to surrounding conditions (Frappaolo 2008). While the explicit emergence of knowledge management in the business marketing and organisational management field occurred recently, the concept of managing knowledge has existed for many years. Alavi & Leidner (1999) noted that manuals, reports, procedures, routines, organization policies as well as training and employee programs have played a critical role in the management of valuable knowledge for a prolonged duration (Alavi & Leidner 2001). However, the language utilized for defining knowledge management is still complex. A summary of the different definitions which was proposed for knowledge management is outlined in Table 2.1.

Table 2.1:Definitions of Knowledge Management

Authors	Definitions
(Wiig 1997)	"The overall purpose of KM is to maximize the enterprise's knowledge- related effectiveness and returns from its knowledge assets and to renew them constantly" (p. 2).
(Parlby 1998)	"Knowledge management means a systematic and organized attempt to use knowledge within an organization to transform

	its ability to store and use knowledge to improve performance" (p. 5).
(Allee 2000)	"KM is the manipulation of knowledge objects (such as documents and organized data) and focuses on organizing, sorting, cataloging and delivering those objects throughout the organization" (p. 1).
(McElroy 2000)	". . . previously viewed KM as little more than information indexing and retrieval, but now sees a new definition emerging – the sustainable creation, transfer, and dissipation of organisational learning" (p. 195).
(Büchel & Probst 2000)	"Managing knowledge requires identifying, acquiring, developing, distributing, utilizing and storing knowledge which is meaningful to the organization" (p. 7).
(Alavi & Leidner 2001)	"Knowledge management is largely regarded as a process involving …. four basic processes of creating, storing/retrieving, transferring, and applying knowledge" (p. 114).
(Marwick 2001)	"[KM is] the set of systematic and disciplined actions that an organization can take to obtain the greatest value from the knowledge available to it" (p. 814).
(Jones 2001)	"Knowledge management is much more than technologies for information sharing and collaboration: it also includes the creation and sustainment of communities of practice, coping with behavioral and cultural aspects of people, and creating trusted and validated content" (p. 307).
(Zhu 2004)	"KM defined broadly is a loose set of ideas, tools and practices centering on the creation, communication and utilization of knowledge in organizations" (p. 67).
(Buckman 2004)	"[KM is the] systematic approaches to help information and knowledge emerge and flow to the right people at the right time to create value" (p. 17).
(Firestone et al. 2005)	"KM is a framework that includes systems, procedures, and a culture you put in place to manage one of your more valuable corporate assets – namely, your knowledge" (p. 126).
(Milam 2006)	"[KM is the] organized complexity of collaborative work to share and use information across all aspects of an institution which marks the effective use of knowledge" (p. 61).
(Bhirud, Rodrigues & Desai 2005)	"Knowledge management is the process of managing the organization's knowledge by means of systematic and organisational specific processes for acquiring, organizing, sustaining, applying, sharing and renewing both tacit and explicit knowledge by employees to enhance the organisational performance and create value" (p. 1).

(Bhirud, Rodrigues & Desai 2005)	"Knowledge management is the process of managing the organization's knowledge by means of systematic and organisational specific processes for acquiring, organizing, sustaining, applying, sharing and renewing both tacit and explicit knowledge by employees to enhance the organisational performance and create value" (p. 1).
(Choy & Suk 2005)	"Knowledge management is a broad subject with many facets ranging from databases to patents, from the intranet to the mentor, from coldly technical to warmly personal concepts" (p.2)
(Sabherwal & Sabherwal 2007)	"The KM process . . . may involve the sharing, application, or creation of knowledge" (p. 411).
(Pauleen 2007)	"KM, which is context embedded, is a particularly culturally dependent process" (p. 4).
(Frappaolo 2008)	"Knowledge management is the leveraging of collective wisdom to increase responsiveness and innovation" (p. 8).
(Kotelnikov 2010)	"Knowledge management is "collecting, leveraging, and distributing both explicit and tacit knowledge throughout your organization" (p. 1).

An overview of the early definitions of knowledge management reveals that they have something in common and share the same interests with similar characteristics. They placed much emphasis on the ability of using, distributing, storing, acquiring, and identifying explicitly documented knowledge (Alavi & Leidner 2001; Allee 2000; Büchel & Probst 2000; Von Krogh 1998). The adoption of networked computers enabled the sharing, storing and codifying of explicit knowledge in an easy and affordable manner than ever before (Hansen, Nohria & Tierney 1999). Many of the knowledge management definitions focused on the organisations' ability to use IT and as a result, their executives invested in information technology (IT) and put emphasis on explicit knowledge and the management of information through IT. The quality of knowledge transfer underwent significant improvement with the introduction and support of IT (Ruggles 1998). However, practitioners and scholars discovered that while IT might enhance knowledge management processes, it is not enough to improve innovation and performance (Khalifa & Liu 2003). Parlby (1998) stated that of the organisations that invested in building IT infrastructure, only a small number applied IT while implementing knowledge management. Organizations utilized IT only in resolving

information access and storage, and knowledge management was isolated or excluded from "daily business" and lacked a long-term or strategic focus (Kok, Jongedijk & Troost 2003). Without any linkage between IT and knowledge management, many knowledge management projects were destined for failure as organisational executives ignored the human aspect of knowledge (Khalifa & Liu 2003) including but not limited to social networks and communities of practice, knowledge managers and knowledge owners' role, knowledge workers' behaviors and practices, organisational strategies and considerations of external work environment (Davenport & Peitsch 2005).

Knowledge management definitions introduced afterwards shift to a focus on creating interpersonal relationships, emphasising knowledge sharing, and managing tacit knowledge (Hansen, Nohria & Tierney 1999; Lee & Choi 2003; Zack 1999). Despite attempts to obtain knowledge from people, most knowledge remains within their head; even though it might constitute an intangible and valuable asset held by an organization, it cannot be easily shared with others (Chou & He 2004; Iftikhar, Eriksson & Dickson 2003; Nonaka 1994; Nonaka, Von Krogh & Voelpel 2006; Shumway et al. 2013). Tacit knowledge sharing has the potential to foster innovation, increase organisational efficiency and promote organisational performance and resilience (Bhirud, Rodrigues & Desai 2005; Nonaka 2007). Information technology enhances distribution, storage, and the codification of explicit knowledge or information and speeds up the pace of development for revolutionary knowledge management, but cannot provide a system that fully supports the capturing and sharing of tacit knowledge of members in an organization (Ford & Chan 2002; Nonaka 1994). Later definitions of knowledge management encompass technological, human, cultural and process aspects of knowledge management. The definitions of knowledge management are no longer restricted to IT, but holistically extend to cover all aspects of an organisation (Gold & Arvind Malhotra 2001; Iftikhar, Eriksson & Dickson 2003).

Furthermore, the recent definitions have affirmed that organisations should have the capacity to create new knowledge using knowledge management practices. Knowledge is developed and produced through processes which transform tacit to explicit knowledge or vice-versa (Nonaka 1994, 2007; Nonaka, Toyama & Konno 2000; Sabherwal & Sabherwal 2007). Nonaka (1994) observed that when individuals within an organization internalize, combine, articulate, share, socialize and externalize tacit and explicit knowledge, new knowledge will be generated. Many practitioners and investigators have

stated that knowledge management should enhance the creation of new knowledge to spur competition and innovation in a company (Bhirud, Rodrigues & Desai 2005; Hsu 2008; Jones 2001; Lee & Choi 2003; Nonaka, Von Krogh & Voelpel 2006; Sabherwal & Sabherwal 2007). Firestone et al. (2005) observed that knowledge management should create a platform to help companies, collective groups and individuals routinely and systematically learn what the person knows, what other people know (for instance, teams and individuals), what the person and the company should learn; effectively and efficiently organize and disseminate their learning; apply their learning to emerging endeavours; and create new knowledge (Firestone et al. 2005).

Examples of areas where knowledge should be managed include supply chain management, data warehousing, taxonomy usage, search engines, document management, project management, business intelligence, customer relations management, training, and best practices (Milam 2006). It is imperative that the knowledge management system be availed at the opportune moment to the intended individuals in need of the information, and be provided in a manner that can enhance the use of such information (Rowland 2004). Simply put, knowledge management has two roles of a) constituting a knowledge repository and b) facilitating the exploitation, nurturing, and cultivation of knowledge at both individual and organisational levels (Gregory 1998; Milam 2006; Scarbrough, Swan & Preston 1999).

2.1.6   Knowledge Management Process

A uniform definition is lacking in the current research literature on what constitutes the knowledge management process. All knowledge management researchers highlight the various knowledge management processes and generate various arguments based on their importance. Knowledge management processes are defined to be the various activities that are started or maintained in organizations that enable the management of the organization's knowledge assets (Suh et al., 2004). These processes tend to be central to knowledge management. Anderson and APQC (1996) developed a process for designing tacit knowledge and sharing it with all individuals in the organization. This process entails the application, sharing, creation, identification, collection, adaptation and organization of knowledge. Little (1998) hypothesized that the processes involved in knowledge management involve acquiring and creating knowledge, storing it, disseminating it and utilizing it. Delphi (1998) hypothesized that knowledge

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management can be split into the four processes of capturing, sharing, leveraging and feeding. Capturing knowledge involves obtaining external knowledge and producing knowledge through experience or research. Knowledge sharing entails the organization having access to information and knowledge at any place and at any time. Leveraging relates to converting knowledge into a product or service. The feeding process involves embedding knowledge in a product to increase its value. Demarest (1997) argued that the process of knowledge management can be divided into the construction of knowledge, its embodiment, its dissemination and its utilisation. Construction relates to the process involved in structuring and discovering a form of knowledge. Embodiment involves choosing where knowledge is contained. Dissemination involves the human process and the technical infrastructure embodying the knowledge to which those in the company have access. Use or utilisation relates to the eventual objective of having a knowledge management system.

Similarly, Ernst & Young (1998) discussed four processes that are involved in knowledge management, namely planning, acquisition, application and assessment. Jang and Lee (1998) proposed an organisational memory process relevant to knowledge creation which entails acquiring knowledge, schema codification, codifying knowledge, retrieving knowledge, embedding the knowledge, analysing a problem, solving the problem and shaping the knowledge. Kolb (1984) suggested a knowledge development process which comprised of experiencing, observing, conceptualizing and experimenting. KPMG (1998) proposed a knowledge cycle representing the seven fundamental processes represented in knowledge management namely creating, applying, exploiting, sharing, disseminating, encapsulating, sourcing and learning knowledge. In their work, Lee and Kim (2001) noted three processes involved in knowledge management namely accumulating, integrating and reconfiguring the knowledge. Knowledge accumulation involves acquiring knowledge through internal creation or from external sources. Integrating and configuring are the main knowledge management processes which involve the creation of knowledge based on the environmental conditions. Leonard-Barton (1995) argued that knowledge management processes comprise problem solving, knowledge implementation and integration, knowledge experimentation and importation. Nevis et al. (1995) categorise knowledge management processes into knowledge acquisition, knowledge dissemination and knowledge utilization. Knowledge acquisition refers to developing or creating skills,

relationships and insights. Disseminating knowledge involves spreading that which is learned. Knowledge utilization refers to integrating learning to widen its availability and for it to be generalized to situations that arise.

Nonaka and Takeuchi (1995) developed a knowledge creation process that involves the sharing of tacit knowledge, concept creation, concept justification, building an archetype and knowledge cross-levelling. Pan and Scarbrough (1998) suggested that knowledge management can be divided into the five phases of knowledge generation, processing, storing, disseminating and using/reusing knowledge. Pentland (1995), based on the findings of Holzner and Marx's study (1979), proposed five processes for knowledge management, namely a) knowledge construction which involves adding or replacing new material in a combined stock of knowledge; b) knowledge organization which involves relating bodies of knowledge to each other and then classifying and integrating them; c) knowledge storage which is the moment a new experience or observation takes place and is ratified as constituting knowledge; d) knowledge distribution which is critical to organizations; and e) knowledge application which focuses on the likelihood of achieving performance improvement. Probst (1998) suggested that there are eight building blocks involved in knowledge management, namely establishing knowledge goals, knowledge identification, knowledge acquisition, knowledge development, knowledge distribution, knowledge preservation, knowledge use and knowledge measurement. Ruggle (1997) suggested three processes namely generating, codifying and transferring knowledge. Knowledge generation entails the activities which bring to light new knowledge to the world, to a group or to an individual;. knowledge codification relates to capturing and representing knowledge so that it can be re-used by an organization or an individual; and knowledge transfer which relates to moving knowledge from one place to another and its consequent absorption. Schuppel et al. (1998) proposed four processes involved in knowledge management namely knowledge acquisition, its retention, its maintenance, and its search and retrieval. Szulanski (1996) stated that the process of knowledge transfer involves its initiation, its implementation, its ramp-up and its integration. Nevis et al. (1995) approached knowledge in terms of its acquisition, its sharing and its utilization. Knowledge acquisition involves developing or creating insights, skills and relationships while knowledge sharing involves disseminating that which has been learned. The utilization of knowledge involves integrating learning so that it is easily accessible and capable of being generalized to

situations that arise. Walsh and Ungson (1991) split the process of developing organisational memory into memory acquisition, memory retention and memory retrieval. Wiig (1995) split the process of knowledge management into knowledge creation, knowledge manifestation, knowledge use and knowledge transfer. Knowledge creation and manifestation relate to the manner in which it is created and the way it manifests in individuals' minds with the involvement of procedures, technology and culture. Knowledge use touches on utilization in decision-making and the rest of work requiring knowledge. Knowledge transfer refers to the way individuals learn and the manner in which they capture and exchange knowledge. Wijnhoven (1998) suggested that the processes of organisational memory can be categorized into knowledge acquisition, its retention, its search, its maintenance and its dissemination.

These and similar studies have relative values for the banking industry. The banking sector is frequently and actively acquiring information, share it and utilize it for the production of new knowledge. They highly involve their customers and local offices through their decision makings processes. Within the banking industry, the intellectual capital results in the accumulation of human capital, which increase the social and relationship capital. The best-performing banks also utilise their intellectual capital very well and their physical capital less. In banks, the intellectual capital positively and significantly contributes to the firm value (Sofian & Dumitru 2017).

2.1.7   The SECI Framework/Model of Knowledge Creation

Nonaka and Takeuchi (1995) proposed a model/framework of knowledge creation which included four processes: socialisation, externalisation, combination, and internalisation which is known as the knowledge conversion theory or the SECI framework. The model describes the interactions between explicit and tacit knowledge and the way these two types of knowledge are converted into organisational knowledge. The SECI model was developed in 1993 when Nonaka and his colleagues disseminated 105 questionnaires to middle managers working in different manufacturing organisations in Japan including Mazda, Honda, Matsushita and Canon to examine the way knowledge is created and the way it can be converted (Nonaka, 1994). After conducting factor analysis on the data, four knowledge conversion modes emerged that were based on tacit and explicit knowledge being transformed. Nonaka and colleagues postulated that the mode through which tacit knowledge is converted into tacit knowledge is labelled the socialization

process while one that involves the conversion of tacit knowledge to explicit knowledge is the externalization process. The mode through which explicit knowledge is converted into explicit knowledge is called the combination process and the mode through which explicit knowledge is converted into tacit knowledge is called the internationalization process (Nonaka, 1994). Nonaka (1994) argued that new knowledge might be created when transforming tacit knowledge to explicit knowledge, a process that is known by externalisation.

According to Nonaka the externalisation process is about converting tacit to explicit knowledge, and is about articulating knowledge (Nonaka, and Takeuchi, 1995). Knowledge articulation and externalisation is essentially done by when knowledge of an individual is shared in public meetings or documented which in turn is received by others either through personal contacts or via reading documents. Often, such conversion offers greater value to the organisations. This aspect of Nonaka's work however has attracted criticisms because some authors believe it is not possible to literally convert one knowledge form to another. Information System researchers Cook and Brown (1999) for example argue that the two knowledge forms exist independently calling into question the claim that tacit-to explicit exclusively represents knowledge creation.

Nonaka and Takeuchi (1995, p. 62) claimed that the SECI model constitutes the engine of knowledge creation. They argued that numerous Japanese companies have successfully employed the model in creating new organisational knowledge. Notably, the model exhibits a significantly integrative KM approach that combines numerous knowledge processes such as the generation, codification, storage, sharing and utilization of knowledge (Aurum et al., 2008; Grant and Grant, 2008; Haggie and Kingston, 2003; Mikic et al., 2009). Importantly, the SECI model is represented as a fusion of several processes, people and technology (Alhawary 28 and Alnajjar, 2008; Bose, 2002; Nonaka and Konno, 1998; Smith, 2001). Figure 2.1 illustrates the four processes involved in the SECI model (Nonaka and Takeuchi, 1995).
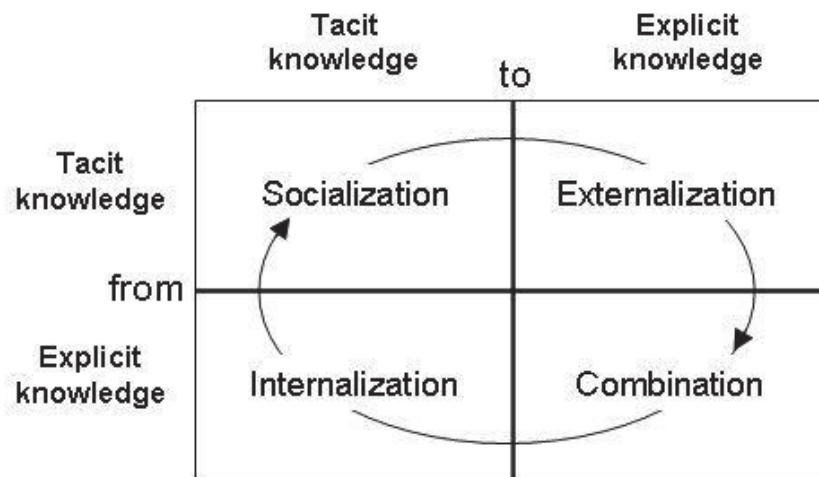
Figure 2.1: Modes of Nonaka's knowledge conversion model (Nonaka and Takeuchi, 1995)

2.1.7.1   Socialization

Socialization (tacit to tacit) involves the process of bringing people together and creating tacit knowledge through shared values and experiences (Nonaka, 1994). Linderman et al. (2004) noted that this mode of knowledge conversion requires individuals to interact with one another. By doing so, individuals develop tacit knowledge in terms of technical skills or shared mental models. There is a possibility that tacit knowledge is shared through the process of socialization without any language being used, as with imitation, observation, and mentoring as well as active practice. The shared experience stimulates socialization as it helps individuals identify and integrate each other's feelings and beliefs (Linderman et al., 2004). In terms of process improvement, it is possible to promote socialization practices through the assembly of cross-functional project teams which disregard hierarchical boundaries (Anand et al., 2010). Socialization practices integrate the tacit knowledge that individuals have in producing a common understanding that team members develop regarding the process requiring improvement (Fiol, 1994; Weick & Roberts, 1993). Similar to Linderman et al.'s (2004) suggestion, Anand et al. (2010) observed that socialization practices enable team members to incorporate the perspectives that other team members hold in relation to their practices while evaluating process improvement issues, opportunities and solutions.

Communicating ideas among team members becomes easier through the socialization practices as it increases the individuals' awareness of problems which they are not likely to consider when working alone (Anand et al., 2010). These socialization practices entail brainstorming, generating ideas, root-cause problem analysis, nominal group techniques and structured project facilitation methods (Anand, et al., 2010; Breyfogle III, 2003). Process improvement methods and tools assist in providing insights into problems and the ways to solve them (Linderman et al., 2010). Through the socialisation process, a shared problem-solving methodology is established that can help team members engage with each other socially in order to facilitate the development of a shared understanding about opportunities and challenges faced (Linderman et al., 2010). Apart from facilitating social interaction, a technical problem-solving language enhances insights into the technical facets of process improvement (Linderman et al.2010, p. 690). Arguments made by research scholars reveal that effective interaction and discussion in problem-solving sessions are capable of enabling teams within a business entity to come up with a common mind-set and subdue defensive routines and cultural barriers (Schein 2010).

2.1.7.2   Combination

The combination process constitutes the utilization of social processes by combining various parts of explicit knowledge held by individuals or stored in information and communication systems (Nonaka 1994). It entails the process in which concepts and various parts of explicit knowledge are systemized and combined (Linderman, Schroeder & Sanders 2010). Combining the explicit knowledge held by individuals is done through communication channels and exchange mechanisms such as telephone conversations, meetings, e-mail, newsletters, memos, team briefings, noticeboards and videos. Repurposing and recombining existing knowledge to create new knowledge is possible through the sorting, adding, re-categorization and re-contextualization of explicit knowledge. Therefore, combination involves the creation of explicit knowledge derived from explicit knowledge (Nonaka 1994). For process improvement scenarios, combination practices are responsible for creating new knowledge as they enable team members to identify the explicit relationships that exist between different individuals by measuring and analysing data (Zhang, Lim & Cao 2004).

Such practices enable the combination of fragments or pieces of explicit knowledge from various sources and by reconfiguring and systemizing the pieces that lead to the creation of new explicit knowledge (Constant, Sproull & Kiesler 1996). The recombination of existing explicit knowledge is possible through specialized knowledge-sharing systems and database applications with modern search capabilities (Voelpel, Dous & Davenport 2005). These computer-based systems can assist teams understand the cause-effect relationships through the combination of various elements of explicit knowledge as process improvement takes place, so it can render explicit knowledge useful in solving problems (Breyfogle III 2003). Combination practices enable project managers and leaders to support their teams while scrutinizing explicit knowledge to create new insights and explicit understanding regarding the targeted process (Anand, Ward & Tatikonda 2010).

2.1.7.3 Externalization

The externalization process entails converting tacit knowledge to explicit knowledge (Nonaka 1994) where the use of metaphors are seen to be an effective means of converting tacit knowledge to explicit knowledge. This is the initial step in tranforming tacit knowledge into explicit knowledge. In line with Nonaka (1994), Linderman, Schroeder & Sanders (2010) stated that the externalization process occurs when metaphors, concepts, models, analogies and hypotheses are developed when teams create concepts, prompted by discussion forums and shared reflection (Linderman, Schroeder & Sanders 2010). From a process improvement perspective, externalization practices enable individuals to express their tacit concepts and ideas explicitly. This can be in the form of language or visual schemata. Such practices transform the tacit language that individuals in a team use into explicit forms such as diagrams, numbers, pictures and written descriptions which subsequently contribute to group analysis and discussion (Anand, Ward & Tatikonda 2010).

During the externalization process, individuals are able to view, review and express the knowledge that they create jointly by exchanging and synthesizing tacit knowledge, where a common understanding may develop. The tendency of externalization practices is to assign subjective performance attributes to knowledge with explicit measurements, which prompts assessments, comparisons and scientific experimentation to be undertaken (Anand, Ward & Tatikonda 2010). The expression of tacit knowledge through the externalization process is likely to assist teams in establishing ways to use

the captured explicit knowledge to improve a process (Raelin 1997). Even though the individuals' concurrent activities and the physical proximity that the team members have might be necessary in socialization practices, it is possible for communities of practice to effectively utilize externalization practices across distances (Voelpel, Dous & Davenport 2005). Externalization practices motivate the expression of ideas between team members as they offer structured approaches to converting ideas into an explicit form (Tucker 2007).

2.1.7.4 Internalization

The internalization process has been defined as the process through which explicit knowledge is converted into tacit knowledge. The internalisation process shares similarities with the conventional concept of learning being strongly linked to action. Linderman et al. (2004) posited that verbalizing or diagramming knowledge into manuals, documents or oral stories assists in converting explicit knowledge into tacit knowledge. Documentation assists in internalizing experiences, which extends the tacit knowledge that individuals have. Internalization involves individuals absorbing tacit knowledge either through demonstrations or other means (Sabherwal & Becerra-Fernandez, 2003). It regularly takes place when one re-experiences what has been learnt, as evident in learning through experience (Linderman et al., 2004). In process improvement circumstances, internalization practices promote the process of converting explicit knowledge into tacit knowledge. Such a process can lead to shared insights among those in the team in relation to the best approaches to accomplishment a given task (C. W. Choo, 1998; Grant, 1996). Internationalization practices are those efforts adopted to understand and implement best practices borrowed from different projects and areas of the organization (Tucker et al., 2007).

Internalisation practices tend to enable explicit knowledge to be captured and converted into valuable forms which can be understood and drawn upon by those working on various processes (Anand 2012). Converting explicit knowledge into valuable forms assists in creating collective knowledge on the way processes are held in reserve for improvement (Anand 2010). Furthermore, internalization entails learning-through-practice which is an instance of on-the-job training that relies upon the application of explicit knowledge emanating from the improvement projects that were previously completed (Becerra-Fernandez & Sabherwal, 2001). Becerra-Fernandez & Sabherwal

(2001) proposed that the ability to transform explicit knowledge into action and practice illustrates the tendency of internalization practices in individuals to assist them to re-experience what others have experienced, consequently creating tacit knowledge in them. Moreover, virtual situations are also sources from which tacit knowledge can be acquired either indirectly via listening or reading stories that others provide, or through experiential means such as experiments or simulations (Becerra-Fernandez & Sabherwal, 2003). The use of mistake/error-proofing procedures and control charts as quality control techniques are part of internalization practices (Anand 2010).

Within the banking industry, Easa (2012) studied the use of the SECI model in Egyptian banks and its effect on the innovation process. The author found that the SECI processes are used for the creation of knowledge in Egyptian banks; however, it was noted that some self-imposed limitations reduce the benefits of the socialisation and externalisation processes in knowledge creation and exchange. Conversely, the author showed that the internalisation and combination processes face fewer limitations, disclosing that the Egyptian banks focus more on formal rather than informal knowledge. This study supports the universal view of the SECI model, but the application of each process depends on the cultural context, leadership support, and types of task. The study also suggested that the processes outlined in the SECI model, separately of collectively, have a positive and significant impact on the innovation process as they increase the generation of ideas for banking services, products and processes. Easa's study is a useful case within the banking industry that provides a platform for the conduct of the present research project (Easa 2012) in Saudi Arabia.

2.2   Resilience

2.2.1   The Concept of Resilience

The concept of resilience, originating from the Latin resilire - 'to leap back'-, has been used in different academic settings and contexts, such as ecological science, psychology, systems engineering, organisational sciences, economics, disaster management, management, security, and supply chain management (Bec & Dredge 2014; Coaffee 2013; Duijnhoven & Neef 2014). Resilience is an overloaded term which means somewhat different things in different fields (Madni 2007). It has been defined from various aspects to suit the range of contexts in which it has been applied. While the

definition may differ from one context to another, the concept is closely related to the capability and ability of an element to return to a stable status after a disruption (Bhamra, Dani & Burnard 2011).

Historically, the term "resilience" originated in the 1970s in the field of ecology from the research of C.S. Holling (1973) through analyzing the behavior of ecological systems. He was one of the first researchers who noticed systems' behavior could be best defined through two distinct properties: resilience and stability, stating "**resilience** determines the persistence of relationships within a system, and is a measure of the ability of these systems to absorb and adapt to changes of state and driving variables and other parameters, hence the ability to carry on their functions" (Holling, 1973, p. 17). This definition views resilience as a system property and persistence or probability of extinction is the result. **Stability**, on the other hand, is the ability of a system to return to an equilibrium state after a temporary disturbance. The more rapidly the system returns, and with the least fluctuation, the more stable it is. Stability is defined as the property of the system and the degree of fluctuation around specific states (Holling 1973). Similarly, Pimm (1984) defined resilience as the measure of the speed of a system's return to equilibrium following a perturbation. Holling called this "engineering resilience" but contrasts with his preferred definition of resilience as a measure of absorptive capacity, which he denotes as "ecological resilience" (Pisano 2012).

Table 2.2: Definitions of resilience

Context	Author	Definition
Ecological systems	Holling (1973))	"The measure of the persistence of systems and of the **ability to absorb** change and disturbance and still **maintain** the same relationships between state variables".
	Tilman and Downing (1994)	"The speed at which a **system returns** to a single equilibrium point following a disruption".
	Gunderson (2000)	"The **magnitude** of disturbance that a system can absorb before its structure is redefined by changing the variables and processes that control behaviour".

	Walker et al. (2004)	"The capacity of a system to **absorb** a disturbance and **reorganise** while undergoing change while retaining the same function, structure, identity and feedback".
Engineering	Hollnagel et al. (2006)	"The ability to **sense**, **recognise**, **adapt** and **absorb** variations, changes, disturbances, disruptions and surprises".
Socio–ecological systems	Walker et al. (2002)	"The **ability to maintain** the functionality of a system when it is perturbed or the ability to **maintain** the elements required to renew or reorganise if a disturbance alters the structure of function of a system".
	Carpenter et al. (2001)	"The **magnitude** of disturbance that a system can tolerate before it transitions into a different state that is controlled by a different set of processes".
Physical systems	Bodin and Wiman (2004)	"The speed at which a system returns to equilibrium after displacement, irrespective of oscillations indicates the elasticity (resilience)".
Physical sciences	(Lengnick-Hall, Beck & Lengnick-Hall 2011)	"a material is resilient if it is **able to regain** its original shape and characteristics after being stretched or pounded".
Individual	Coutu (2002	"Resilient individuals 'posses' three common characteristics. These include an **acceptance of reality**, a **strong belief** that life is meaningful and the **ability to improvise".**
Psychology	(Block & Kremen 1996)	"the ability to **bounce back** from negative emotional experiences".
	Luthans et al. (2006	"The developable **capacity to rebound** from adversity".
Health	(Resnick et al, 2011).	"The **capacity to maintain** good health in the face of significant adversity".
Disaster management	Paton et al. (2000)	"Resilience describes an active process of self-righting, learned resourcefulness and growth. The concept relates to the ability to function at a higher level psychologically given an individual's capabilities and previous experience".
	(Bruneau et al. 2003)	"The ability of social units to **mitigate** hazards, **contain** the effects of disasters when they occur and carry out recovery activities that minimize social disruption and mitigate the effects of future earthquake".

Organisational	Horne and Orr (1998	"Resilience is the fundamental quality to **respond productively** to significant change that disrupts the expected pattern of event without introducing an extended period of regressive behaviour".
	Sundström and Hollnagel (2006)	"an organization's ability to **adjust effectively** to the multifaceted impact of internal and external events over a significant time period and to deal with unexpected and disruptive events and understand their long term impact".
	McDonald (2006)	"The capacity of an organisational system to **anticipate and manage risk effectively**, through appropriate adaptation of its actions, systems, and processes, so as to ensure that its core functions are carried out in a stable and effective relationship with the environment".
strategic	(Hamel & Valikangas 2003)	"The ability to dynamically **reinvent business** models and strategies as circumstances change, to continuously **anticipate** and **adjust** to changes that threaten their core earning power—and to change before the need becomes desperately obvious".
Business	(Gaddum 2004)	"The ability of an organization's business operations to **rapidly adapt and respond** to internal or external dynamic changes - opportunities, demands, disruptions or threats - and continue operations with limited impact to the business".
Supply chain	(Rice & Caniato 2003)	**"The ability to react** to an unexpected disruption and **restore normal** operations".
	(Ponomarov & Holcomb 2009)	"The adaptive **capability to prepare** for unexpected events, **respond** to disruptions, and **recover** from them by maintaining continuity of operations at the desired level of connectedness and control over structure and function".
Management	(Fani & Fard 2015)	"An organization's **ability to rebuild** itself in the wake of a threat that compromises its market share, productivity, reputation, brand image or mission".

Many definitions of resilience, according to Schoon (2005), are based almost exclusively on the work of Holling. A review of the definitions given in Table 2.2, shows that the literature refers in one manner or another to the work of Holling. The table shows the diversity of resilience definitions and also highlights the distinctions between them but all have roots in Holling's initial concept. These definitions can be divided into two categories: those that define resilience as the proactive capacity to prepare for disasters

or unforeseen events before they occur: or, simply, anticipatory adaptation, which means acting to reduce organisational vulnerability before the occurrence of undesirable events; and those that define resilience as the consequences of disaster – or what may be described as reactive capacity for recovery. Madni and Jackson (2009) and Westrum (2006) argue that a resilient system should include at least two dimensions of the following: avoidance, survival, andr recovery. Avoidance has been described as the preventive aspects of a system's resilience relative to a disruption and goes beyond traditional system safety considerations to include anticipation of an accident based on the ability to detect "drift" towards system brittleness/instability, an indication of potential accidents. Survival has been described as the ability of the system to resist destruction or incapacitation/breakdown in the face of a disruption; and recovery pertains to the ability of the system to survive a major disturbance albeit with reduced performance occasionally. This recovery capability of the system is considered the central focus of system resilience.

Along similar lines, Madni and Jackson (2009) incorporated all these facets of system resilience and provided one of the most comprehensive perspectives on organisational resilience. The authors defined resilience as a multi-faceted capability of a complex system that encompasses avoiding, absorbing, adapting to, and recovering from disruptions, as shown in Figure 2.2. Avoiding disruptions requires anticipation, which is enabled by predictive or look ahead capabilities. As such, a system that exhibits avoidance requires the ability to preview outcomes and take proactive action to avoid either the occurrence or the consequences of the disruption. Withstanding disruptions requires the system to be robust. Robustness is achieved by having "shock absorbers" in the form of, for example, resource buffers that enable the system to withstand and resist a disruption without having to re-configure itself to respond to the disruption. **Adapting** to unexpected change requires the ability to reconfigure form (i.e., structure) or available capacity. **Recovering** implies the ability of a system to restore the system's pre-disruption state as closely as possible.

Figure 2.2: Different faces of resilience (Madni and Jackson 2009)

System resilience is therefore considered a feature of complex systems such as companies, cities or ecosystems, due to their capacity to survive, adapt and grow in the face of turbulent change (Fiskel 2006; Siebert 2009). Rose (2004) distinguishes two aspects of resilience: inherent which is the ability of a system under normal circumstances and adaptive which is the ability of a system in crisis situations due to ingenuity or extra effort. The author identified three levels at which resilience can take place: microeconomic which includes the individual behavior of companies, households, or organizations; mesoeconomic which refers to the economic sector, individual market, or cooperative group; and macroeconomic which includes all individual units and markets combined, though the whole is not simply the sum of its parts, due to the interactive effects of an economy.

Resilience is also considered a function for both the vulnerability of a system and its adaptive capacity (Dalziell & McManus 2004). Fiksel (2003) identifies four system characteristics that contribute to resilience, namely diversity which is variation with respect to form and behavior; efficiency which is the economical use of resources; adaptability which means flexibility to change; and cohesion which relates to the unifying relationships and linkages between system components. A simplified graphical representation of thermodynamic systems was proposed by the author to characterize the different types of resilience. Each system has a stable state representing the lowest

potential energy at which it maintains order, and when the system is subject to distress and perturbations that shift it along a trajectory of adjacent states. Examples of system behavior are shown in Figure 2.3.

Potential energy

Adjacent system states
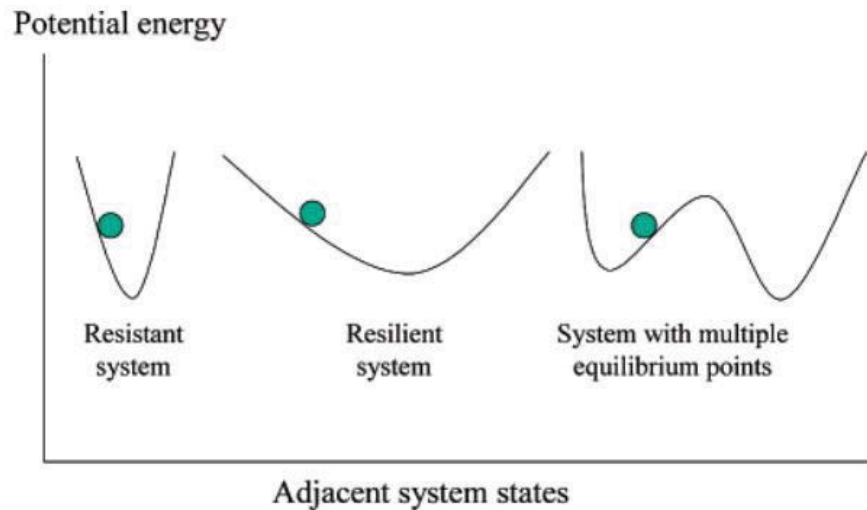
Figure 2.3: System trajectory (Fiskel, 2003).

System (i) is typical of an engineered, highly controlled system that operates within a narrow band of possible states. Although the system is designed to resist perturbations from its equilibrium state and to recover from small distresses, the system is unable to survive a large perturbation. As such, the system can be considered resistant, but not resilient. System (ii) is typical of social and ecological systems. As it is able to retain a fundamental function across a broad range of possible states and then gradually return to equilibrium, it can be characterized as a resilient system. System (iii) shows more resilience than system (ii), as it is able to tolerate larger perturbations, and under certain conditions, it has the ability to shift to a different equilibrium state, representing a fundamental change in its structure and function. Hollnagel, Nemeth & Dekker (2008) defined the quality of a system or organisational resilience through four "essential" abilities that it must have: the ability to respond to regular and irregular threats through both prepared and adaptive manners; the ability to flexibly monitor the system, both internally and externally; the ability to anticipate system perturbations and their consequences; and the ability to learn from these experiences.

Gibson and Tarrant (2010) outlined the four resilience strategies, viz. resistance, reliability, redundancy and flexibility as contributing to resilience. Resistance strategies improve the robustness of organizations to resist disturbances; reliability strategies help organizations recover from disturbances; redundancy strategies manage foreseeable volatilities (similar to anticipating and avoiding disturbances); and flexibility strategies enable organizations to adapt to extreme circumstances. This construct of an organisational resilience framework supports the views of Diamond (2005) on the reasons for societal collapse based on the failure to anticipate a problem before its arrival, failure to perceive it when it has actually arrived or failure to solve it after being perceived.

2.2.2 Organisational Resilience

Due to the increasingly uncertain and complex situations faced by business organizations, there has been growing interest in organisational resilience in recent years. Hamel & Valikangas (2003) however argue that the world around us is becoming turbulent faster than organizations are becoming resilient to change. If organizations are to survive and sustain their profitable status, they need to be resilient and robust. Resilience is becoming acknowledged as a crucial organisational capability, a critical competence needed to bounce back after experiencing major crises, disturbances, stress or unforeseen events. In organisational theory, resilience (sometimes resiliency) often has been used to refer to a characteristic or capacity of individuals or organizations, or more specifically (a) the ability to absorb strain and preserve (or improve) functioning, despite the presence of adversity (pressures and external adversity, such as such as increasing competition and demands from stakeholders and internal adversity, such as rapid change, poor leadership, performance and production pressures;   or (b) an ability to recover or bounce back from untoward events (Sutcliffe & Vogus, 2003). This works in practice but not in theory (Laporte & Consolini,1991).

There is no standard definition of organisational resilience, or the source of resilience in organizations. Resilience has been defined as the capacity of an organization to survive, adapt, and grow in the face of uncertain conditions (Bhamra, Dani & Burnard 2011; Lengnick-Hall, Beck & Lengnick-Hall 2011). Zaato & Ohemeng (2015) define organisational resilience as an organization's capability to anticipate key events from evolving/initial trends, constantly adapt to change, and rapidly recover from disaster,

when it occurs. From a business perspective, Robb (2000, p. 27) states that a resilient organization is one that can sustain its competitive advantage over time through its capability to simultaneously both deliver an excellent performance against current organisational goals and effectively innovate and adapt to rapid, turbulent changes in markets and technologies. The author states that the organization's ability to defeat competitors in a fluid and unpredictable environment reflects its resilience. However, a variety of factors, capabilities and mechanisms and degrees of variations exist that may contribute to the creation of resilient organizations. Zang and Liu (2012) also identified three major features that can contribute to organisational resilience: the ability to self-organize, the capacity for learning and adaptation in the context of change, and the ability to absorb or defend again disturbances while maintaining its core functioning. Likewise, Vossen (1998) identified three characteristics that relate to the resilience of small organizations: adaptability, innovation and flexibility. In a similar vein, Fiksel (2003) suggested a number of characteristics that lead to to resilience, namely adaptability, efficiency, diversity, and cohesion. Madni & Jackson (2009) also proposed the three characteristics of robustness, adaptability, and agility that form resilience. McManus et al. (2008), however suggested some other features that can enhance the organization's resilience including the ability to improve its adaptive capacity, situational awareness, and the management of keystone vulnerabilities. Likewise, for Sanchis and Poler (2013), resilience is identified through the three components of adaptive capacity, vulnerability, and recovery ability. Zaato & Ohemeng (2015) postulated four characteristics for resilient organizations: leadership, organisational design, adaptive capacity, and employees' involvement. In the current study, the review of the literature resulted in the identification of the four factors of innovation, agility, adaptability, and robustness as the key resilience capabilities (Chu 2015; Erol, Sauser & Mansouri 2010; Fricke & Schulz 2005; Kantur & İşeri-Say 2012; Oh & Teo 2006; Singh 2014).

2.2.2.1   Adaptability

Adaptability is considered an essential component of resilience (Buliga, Scheiner & Voigt 2016). Adaptability, a term with an extensive history in biology and environmental science, is identified through a condition mode in which living systems accomplish goodness of fit (Stoica et al., 2003). In the business setting, adaptability exists in the domain of contingency theory, and refers to the interface between an organisation and

its condition or status (Hallen et al., 1991). According to Ashford (1986), adaptability is the ability of the organization to change its behaviors, structures, and configuration which may best fit a particular environment. In the same context, Koberg et al. (2000) expressed that adaptability is directed at maintaining and improving organisational performance by modifying the organisational structures, strategies, and processes that are in line with the environment. Hrebinak and Joyce (1985) defined adaptability as the organization's ability to cope with changes or to capture and capitalize on new opportunities from emerging-market environments. For the purpose of this thesis, adaptability is defined as the capability of an organization to continuously adapt and adjust to changes in the face of the ever-changing environment.

2.2.2.2 Robustness

Robustness is another fundamental component of resilience even though its contribution to competitive advantage has been under debate due to divergent understanding of the researchers, practitioners and scholars (Buliga, Scheiner & Voigt 2016; Singh 2014). Robustness was initially derived from physics and computer sciences and is described as the capacity of a system to quickly return to and maintain a desired state despite fluctuations in the behavior of its component parts or in its environment during and after disturbance (Buliga, Scheiner & Voigt 2016; Lengnick-Hall, Beck & Lengnick-Hall 2011). It has been defined as an organization's ability to resist change without losing stability (Mili & Center 2011). Arghandeh et al. (2016) refer to robustness as an ability to cope with a given set of disturbances and to maintain and sustain its functionality. In engineering, robustness refers to the maintenance of system performance either when subjected to external, unpredictable perturbations, or when there is doubt about the values of internal design parameters (Carlson and Doyle 2002). In socio-ecological systems (SES), Anderies et al. (2003) define robustness as the ability of a SES to remain in its social or ecological domain of attraction for a particular time frame. In an organisational and strategic context, however there is no universally agreed definition of robustness. The most formative definitions view organisational resilience as a positive attribute, indicating robustness as an organisational capacity for damage absorption. In the context of this research project, robustness is defined as an organization's ability to withstand stress and therefore avoid loss of function (Coutu 2002; Bruneau et al. 2003; Wicker et al. 2013).

Oluwasoye & Ugonna (2015) suggest that organisations that exhibit robustness are often quicker to adapt, are better at rolling out strategies and are more capable of delivering favourable results. According to these authors, the combination of the two concepts of robustness and resilience offer a better advantage for organizations in terms of managing environmental risks and disasters. In the same vein, Singh (2014) proposed robustness and resilience as the two integral parts of an organisation's change capability that, in turn, will lead to a competitive advantage over its rivals. Improved organisational robustness can enhance its ability to deal with uncertainty in its components and environment and to preserve important structural and functional properties. Organizations seeking to remain competitive, effective and resilient require robustness to respond to change in their complex, internal and external environment (Arghandeh et al. 2016; Snihur & Zott 2013).

2.2.2.3   Agility

Agility is an essential characteristic of organisational resilience. The existing literature indicates that agility is a part of resilience and is linked with the characteristics of organizations which have high resilience (Christopher & Peck 2004; Chu 2015; Dalziell & McManus 2004; Oh & Teo 2006). The most important features of agility are the ability to anticipate and predict problems and respond quickly and efficiently to environmental changes (Chung et al. 2012; Kidd 1995; Wildavsky 1988). Helaakoski, Iskanius & Peltomaa (2007) defined agility as an ability of the system to respond to uncertainties that arise from change and emerging situations. Similarly, Fricke & Schulz (2005) described agility as an organization's ability to change quickly, while Kidd (1994) defined agility as the quick and proactive adjustment of organisational elements to unexpected and unpredictable changes, by preparing for change, providing value to customers, developing virtual partnerships, and assessing human knowledge (Goldman et al. 1995). Consistent with the previous literature, in this empirical research (Chu 2015; Chung et al. 2012; Mao, Liu & Zhang 2015; Oh & Teo 2006), agility is defined as an organisation's capability to respond quickly and effectively to threats and opportunities in the face of changing environments.

2.2.2.4 Innovation

The term innovation capability has been viewed as a multifaceted construct, and is therefore defined in several ways. Innovation has been described as one of the most important elements for building resilience (Oh & Teo 2006). In a highly volatile business environment, innovation is widely recognized as a critical drive for competitive advantage (Crossan & Apaydin 2010). Through the literature review, it was established that an organization's ability to produce innovations is a key factor in determining its success. Oh & Teo (2006) define innovation as a capacity to offer a variety of novel and original products and services rapidly. It is the process of taking useful ideas and converting them into useful products, services, processes, or methods of operation (Lawson & Samson 2001). These useful ideas are the result of social interactions that enable knowledge creation and sharing. As such, many research scholars argue that an organization's capacity to absorb, integrate and apply knowledge determines its degree of innovation (Ramírez, Morales & Rojas 2011; Sankowska 2013; Svetina & Prodan 2008). Considering the above, the ability of the organization to create new knowledge through social interactions between its employees is considered to be the cornerstone of innovation. The above definition of innovation is however quite limited when compared to Nonaka's understanding. Innovation relates to the organisation as a whole, from the conception of an idea to the introduction of a product or service to the market which is novel to company or country but is not necessarily new to the world.

2.3 Organisational Performance

Improving the performance of an organization is the main focus of management today. This is why effective management is heavily dependent on the proper measurement of performance and outcomes to achieve its objectives (Kanji and Sá , 2002). Organisational performance is an outcome of numerous factors that include corporate culture and image, group/team interaction and communication, work processes, leadership, polices, loyalty, and a climate that encourages creativity and innovation (Cho, 201). The organisational performance measures can be divided in two groups: financial and non-financial performance measures. Financial performance measures are measures such as net

earnings and returns on investment relating to pursuing short-term fixes over long-term strategic goals; non-financial performance measures are measures such as customer satisfaction, work processes leadership, efficiency, and market share (Niven 2010; van Gijsel 2012). One important disadvantage of the non-financial performance measures is that they are subjective and susceptible, thus, it is not easy to control, measure and manage them. Therefore, many organizations neglect the use of non-financial indicators and rely entirely on the financial indicators of organisational performance. A review of the literature indicates that although these measures are important indicators of an organisation's profitability and most often exhibit the definitive aim of the organisations' operations, relying solely on these measures is not suitable for the competencies for which contemporary organisations are looking (Gomes, Yasin & Lisboa 2004). As such, organisations are required to measure their performance qualitatively.

2.3.1 The Balanced Scorecard

The balanced scorecard metric was developed in the early 1990s by Robert Kaplan and David Norton as a comprehensive performance management tool for monitoring organisational vision and strategic objectives and the feasibility of achieving these objectives, as it integrates both aspects of organisational performance: financial and nonfinancial, focusing on both the internal and external performance indicators of the organization (Huang 2009; Kaplan & Norton 1996; Niven 2010).

The balanced scorecard has been defined in various ways by practitioners and researchers. Kaplan and Norton (1992) pointed out that BSC is not limited to financial measures that refer to the economic consequences of actions already carried out, but also operational measures for internal business processes, organisational optimization and innovation and customer satisfaction, which play an important role in driving the results of future financial performance. The BSC is a more complete measure of organisational performance compared to traditional financial measures. It includes four financial perspectives: the customer perspective, internal business processes, learning and growth. According to Huang (2009) and Kaplan & Norton (1996), organizations can link long-term strategic objectives to short-term actions by combining financial and non-financial measures, which in turn, will enable their managers to consider various reciprocal relationships and causal effects.

Niven (2002) points out that the main motivation behind the development of the BSC was to overcome the limitations of traditional performance measurement instruments by achieving an equilibrium between the financial and non-financial indicators of future performance. In today's business environment, non-financial indicators are becoming more significant in determining organisational business performance as financial measures alone are not completely able to contribute to an organisation's success without the inclusion of non-financial assets, such as organisational capabilities and competencies and business relationships (Kanji & Sá, 2002; Kaplan & Norton, 1996). In this context, Kaplan and Norton (2001) emphasized that managers need to measure their organisational performance in many business areas in a complex business context, rather than a sole measure being adopted to assess core aspects of the business or identify performance objectives (Kaplan & Norton, 2001b). BSC is a measure of performance that balances internal and external factors against the organization's financial and innovative side (Niven 2010).

The organization's internal aspects are the organisational processes and activities that are directly associated with achieving the organisational objectives and goals. On the other hand, the organization's external aspects are concerned with the customer's perspective or customer-related issues (Niven, 2010). Finally, the BSC framework is based on the balance between leading and lagging indicators that can be considered as the outcomes and drivers of the organisational goals (Niven, 2002, p. 23). Revenue, innovation, employee satisfaction, process-improvement initiatives, and customer satisfaction are some examples of the lagging indicators, which are typically unable to provide any estimating capability, while also being readily available and clear. In contrast, leading indicators are usually measures for activities and processes, adopted to identify challenges before they occur (Goldner 2009). The leading indicators provide quick feedback when substandard performance results are revealed. On the other hand, poor outcomes often cannot be explained through lagging indicators, despite their ability to evaluate management effectiveness in the organisation. For instance, the lagging indicator would be consumer satisfaction when the leading indicator is on-time delivery.

2.3.1.1 The customer-related perspective

An organization's prosperity and sustainability depend heavily on its ability to build trust and a strong long-term relationship with its customers. The customer-related

perspective is primarily related to the external customers of the organization and is therefore considered an external perspective, and it was not considered an important indicator of the organization's performance until recently. Niven (2002) indicated that the absence of the customer perspective may mean that an organization is not able to distinguish itself from its rivals. The main purpose of this perspective is how customers perceive the company and how well the company serves it targeted customers to achieve its financial objectives (Huang, 2009). According to Ehlers and Lazenby (2004), customer dissatisfaction is not only a sign of poor performance but is also a key indicator that forecasts a high probability of future decline although the current financial predictions might appear promising. Accordingly, the importance of the customer's perspective in measuring the company's performance should not be overlooked. Consumer profitability, consumer retention and attraction in specific segments, account sharing with specific consumers and market share in relation to particular consumer sectors are the main outcomes of the customer perspective (Huang, 2009, p. 211).

The customer-related perspective can be measured via the three value disciplines of customer intimacy, product leadership, and operational excellence (Luo, Fan & Zhang 2012). The customer confidence and intimacy discipline is linked to the relationship between the organization and its clients. To build deep and lasting relationships with its customers, the organisation should satisfy them by meeting their specific requirements. The product leadership discipline aims to continuously offer superior and innovative products and services. Finally, operational excellence refers to the organization's ability to offer reliable products and services at competitive prices delivered with fewer defects and better quality.

2.3.1.2 The internal business perspective

Customer-based measures are significant, but they must be translated into measures of what the organisation should do internally to achieve the expectations and desires of its customers (Luo, Fan & Zhang 2012). Excellent customer service often stems from a combination of internal processes, actions, and the decisions being made throughout the organization. Managers can evaluate the effectiveness and quality of an organisation's operations through internal business performance measures (Rampersad, 2006) which can identify the current business processes and their contribution to the success of the organization (Smith, 2010). Therefore, as Kaplan and Norton (1992; 1996) suggested, an

organisation must define and measure its core competencies and then focus on those areas to ensure long-term growth and the success of its business. The successful financial performance of an organization is a result of the effective implementation of strategic initiatives in its core internal processes (Freier & Protil 2009). From the perspective of the internal business, the development and enhancement of employees' capabilities is the most effective way to improve internal business processes (Huang, 2009).

According to Kaplan and Norton (1992), the internal business perspective can be measured through processes, actions, and the decisions being made throughout the organization to meet the expectations and desires of its customers. The internal business process perspective measures focus on the internal processes that will have greatest impact on customer satisfaction and achieving an organization's financial objectives. In this context, Niven (2010) classified the internal process measures into four groups: operations management, customer management, innovation, and regulatory and social measures as the critical internal processes in which the organization must excel (Kommche 2017). *Operations management measures* are the basic, routine, and daily operations necessary to ensure that the organization's activities continue in the same efficient manner. Examples of operations management are cycle time from application to funding, planning processes, throughput time, and quality control processes (Niven 2010). *Customer-management measures* are those measures that expand and deepen the relationship between the organization and its customers, such as customer segmentation, cross-selling, and understanding customer needs by using customer profiles. *Innovation measures* are more connected to the internal process of how the organization can create and provide attractive new products or services to distance and differentiate itself from its rivals. Examples of innovation measures are employee hours on research and development, dollars spent on research and development, and the number of new products or services introduced, etc. Finally, regulatory and social measures focus on establishing and strengthening the relationship between the organisation and its stakeholders.

2.3.1.3 The learning and growth perspective

The learning and growth perspective focuses on the organization's intangible assets, particularly on the skills and capabilities of staff who are required to support the internal processes of value creation. In today's changing and competitive business environment,

learning and innovation are crucial for the survival of any organization. The ability of the organization to learn, improve, and innovate is directly linked to the value of the organization, which will enable the organization to launch new products / services, create more value for customers and continually improve operational efficiency, thus the organization will be able to break into new markets and increase revenues and margins, and grow the value of the company for shareholders (Kaplan & Norton 2005).

According to Huang (2009), the learning and growth perspective indicates the ability of employees, information systems, and organisational alignment to manage a business and adapt to change. There are three main areas to focus on when developing measures for the learning and growth perspective, specifically human capital, information capital, and organisational capital (Niven 2010). Human capital focuses on ensuring that the organization' employees have the required competencies, skills, and knowledge to excel. The information capital component of learning and growth measures the organization's ability to provide its employees with certain intangible and physical tools, and access to information and knowledge to implement the organization's strategies. Organisational capital measures relate to the satisfaction of employees and to ensuring that they have a healthy and safety life, as well as facilitating the alignment between employees and the organization's vision and goals.

2.3.1.4 The financial perspective

The financial perspective shows whether the company's strategy can contribute to improving the company's bottom-line, and the principal business objectives. Many practitioners and researchers have criticized financial measures because of their inability to reflect contemporary value-creating actions, their well-documented inadequacies, and their backward-looking focus (Kaplan & Norton 2005). Kaplan and Norton go further to argue that competition conditions have changed and traditional financial measures do not improve employee motivation, cycle time, quality, or customer satisfaction. They argue that financial performance is the result of the organization's operational procedures, therefore, financial success should be considered a logical consequence of performing the work well .However, the financial performance perspective is one of the most important BSC perspectives, particularly in relation to for-profit organizations, as it can provide the ultimate definition of an organization's success and describes how an organization intends to create value for its current shareholders (Kaplan & Norton 2005;

Reid 2011). Moreover, the financial perspective not only measures revenue growth but also intangible growth aspects that have financial implications, such as increasing the likelihood of selling and market share and acquiring new customers (Brown 2007; Reid 2011). However, in the literature, the financial performance measures are varied. Common examples of the financial performance measures are return on assets, return on equity, and growth in revenue, and many other measures are also used (Capon, Farley & Hoenig 2012).

2.3.2   The Justification of using the BSC

The BSC is more than just a set of financial and non-financial measures, rather it is a translation of the business unit's strategy into a linked set of measures that define both the long-term strategic objective and the mechanisms to achieve and obtain feedback on these objectives (Kaplan & Norton, 1996, 1996). It is a comprehensive performance management tool for monitoring organisational vision and strategic objectives and the feasibility of achieving these objectives, as it integrates both aspects of organisational performance. By using the BSC, the business organization can integrate strategic planning and budgeting processes to ensure that its budget supports its strategy (Kaplan & Norton, 1996). Furthermore, it is an efficient communication tool that can help managers of organizations align an organization's strategy, planning, processes, and people (Huang, 2009).

BSC has widely been considered as a measurement of choice in different business-related fields, including the banking sector (Ahmed et al., 2011; Harold, 2006; Huang and Lin, 2006; Zhang and Li, 2009; Zaman, 2004; Al Sawalqa et al., 2011; Fakhri et al., 2011). BSC has been used and/or recommended as a valid and reliable tool for the assessment of performance in the banking sector in different countries, including Pakistan (Ahmed et al., 2011); India (Harold, 2006); Libya (Fakhri et al., 2011); and China (Huang and Li, 2006; Zhang and Li, 2009). Ahmed et al. (2011) found that all the 27 Pakistani banks in their study used BSC approach in evaluating their performance. The authors concluded that BSC was a valid and reliable tool for use in evaluating performance in the banking sector. Consistent with the findings reported by Ahmed et al. (2011), Fakhri et al. (2011)reported an extensive use of BSC measures in 55 Libyan banks. Harold (2006) argued that the BSC approach may be reliably used to inform performance measurement and management for the IT departments in Indian banks.

The use of BSC to measure and manage performance in banks, noted Harold (2006), can foster the effectiveness of technology use in banks. Further findings in support of BSC use to measure performance in banks was reported among Chinese commercial banks (Hunag and Lin, 2006). After an extensive review of performance measures used in commercial banks in China, Huang and Lin (2006) found that the BSC was suitable in the assessment if performance in banks, and consequently designed a performance evaluation system based on the BSC. Consistent with Huang and Lin (2006), Harold (2006), and Ahmed et al. (2011), Zhang and Li (2009) advised banks to use the BSC as an instrument for enhancing performance in Chinese commercial banks.

The discussion on this section does not provide an exhaustive review of the evidence on the use of BSC in measuring performance in the banking system. Nevertheless, it demonstrates that the BSC measurement approach has enjoyed a wide acceptance among banking scholars and practitioners in different countries. BSC was, therefore, used in the present study to assess performance in the Saudi Arabian banks.

2.4   The banking industry in Saudi Arabia

The Kingdom of Saudi Arabia's financial system includes the Saudi Arabian Monetary Agency (SAMA), approved retail banks, private investment bodies, specialised lending institutions, and the stock market. As a subset of the financial system, the banking system in the Kingdom is governed by SAMA which is the central bank of Saudi Arabia (Saudi Arabian Monetary Authority 2017). Primarily, the country's banking system is headed by a board of directors consisting of a number of authorities and first-line employees. SAMA is government agency which is directly subject to the instructions of the Council of Ministers, of which the Minister of Finance and National Economy is in charge of all SAMA matters.

SAMA was established to supervise banks and financial institutions, manage monetary policies and regulations, oversee the performance of the financial and insurance systems, and to maintain reliability within the banking system. The banking sector in Saudi Arabia has been organised under regulations deriving from a Royal Decree in 1966. Bank certificates/warrants are issued by the Council of Ministers upon the recommendation of the Minister of Finance and a review by SAMA (The International Trade Administration

(ITA) 2017).

The banking sector in Saudi Arabia has made a significant contribution to the Kingdom's economic growth and health (Almounsor & Mensi 2016; Dukheil 1995).Even though a wide range of economic systems, tools, policy reforms and approaches, for example Data Envelopment Analysis (DEA), have been adopted by the Saudi banking system and that the industry performance has been regarded as an indicator of Saudi Arabia's economic development, any improvement in the technical efficiency of the industry has been debated (Almumani 2013). Researchers have identified a list of issues that commercial banks in Saudi Arabia have faced and have discussed how the emerging trends in information and communications technologies can influence the technical efficiency of the banking sector in developing countries (Almumani 2013).

The appropriate measurement of performance and technical efficiency are among the major issues that face commercial banks in Saudi Arabia. Although a number of various economic systems and policy options has been adopted to improve these indices and achieve higher rate of return relative to cost inability to properly use and implement knowledge management by these banks has led to hinder the economic growth and activities in other sectors such as industry and services as banks are linked directly to the entire economy (Almumani 2013). Alabdan & Callen (2015), also, argued that the banking industry must adopt innovative frameworks and models that can encourage the flow of knowledge management towards improved performance and resilience within the banks. The authors however warned that knowledge management initiatives and practices may face barriers such as a lack of learning, technology, and/or leadership which may in turn inhibit their technical efficiency.

For knowledge management to be effective in terms of performance improvement, a provocative environment is required that can inspire individuals and organisations to inherit knowledge and to engage in knowledge transmission and exchange, sharing and collaboration within organisations, and to adapt to change.

2.5 Knowledge creation process and organisational resilience and organisational performance: A critical review

The banking system plays a fundamental role in the success, financial sustainability and economic life of every nation. The banking system however has been widely affected by

economic crises and global financial turmoil in recent years (Bahiti, Perri & Babasuli 2011; Claessens & Van Horen 2015). In particular, it has been subject to intensive debate and subsequently has been greatly subjected to increased economic reforms in developing countries including Saudi Arabia (Hertog 2013; Ramady 2009; Sillah & Khan 2014), as documented in this chapter. Yet, despite these reforms, little certainty and consensus exists on their performance, governance and resilience to change at the global level.

The banking system in Saudi Arabia has undergone considerable changes over the last decade. The system has an important weight in the Middle East. The gradual deregulation of financial service processes in Saudi Arabia has allowed foreign financial institutions to provide financial services in the country. Domestic Saudi banks have also reacted to these changes and introduced a large scale of new products and services. As a result of these changes the Saudi Banks have expanded their operations, have taken advantage of scale and scope of economies, and have produced innovative products for improving their technical efficiency not only locally, but also worldwide (Almumani 2013). According to Al-Muharrami (2009), the Saudi banking industry is the largest banking sector within the Gulf region, and higher level among Arabic language Countries. The Conventional and Islamic banks are the key part of the Saudi banking system that aim to maximise the profit. Yet, very few research has been conducted to investigate how efficient the banking industry is in Saudi Arabia and whether or not the knowledge creation processes contribute to its performance and resilience.

The effective and efficient development, application and implementation of a knowledge management system and practice is believed to be the key to the success of financial institutions including the banking system in the areas of operations, management, accounting and marketing (AlAmmary & Fung 2008; Rasoulinezhad 2011). According to Rasoulzadeh (2011), financial institutions are becoming increasingly dependent on information systems and technologies as this infrastructure has dramatically changed the core of business operations in the banking industry. Indeed, knowledge as an asset or long-term investment and its application are the essence of these institutions in order to achieve a competing advantage. Similarly, in their research on the Gulf Cooperation Council countries, AlAmmary and Fung (2008) found a strong association between knowledge strategy and business strategy and demonstrated that the alignment between

these two variables would clearly influence organisational performance. Knowledge strategy has been highlighted as a new strategic approach to continuous improvement and innovation to reach a competitive advantage. It is at this interface that banks can better compete for their survival and create a larger market share.

The monetary value of integrating knowledge management into business strategy and investment in this area makes it crucial for banks to use the appropriate information and knowledge creation and sharing practices (Rasoulinezhad 2011). There is evidence to suggest that the evolution of knowledge management initiatives and practices in commercial settings, including financial institutions, has increased the competition between the banks which, in turn, has led to an increase in strategies that increase customer satisfaction and human resource practices by improving organisational performance (AlAmmary & Fung 2008; Alrawi & Elkhatib 2009; Rasoulinezhad 2011) and resilience (Fani & Fard, 2015; Mafabi, Munene, & Ntayi, 2012; Umoh & Amah, 2013). AlAmmary & Fung (2008), for example, recognized knowledge as a strategic element in the performance of the banking sector. It is therefore recommended that the banking industry actively incorporate knowledge strategies into their business strategy in order to improve their performance and to be resilient to change.

Old-style organisational management and business strategies that follow power-distance management style and disagree with subordinate engagement in organisational decisions are no longer appropriate in the current ever-changing competitive and uncertain global environment. New approaches or strategies are required that can create and share knowledge, help in the management of information, expertise and knowledge, and employ it in a way that can improve organisational performance and resilience (Baghbanian 2011). Knowledge management, including knowledge, has been documented as a critical determinant of organisational performance, organisational resilience and competitive advantage in both public and private sectors.

Knowledge, as opposed to data or information, and its proper utilisation has been widely accepted and highly recognised as a valuable asset for organisational sustainability and is the key to a continued competitive advantage (ALHussain 2011; Tikhomirova, Gritsenko & Pechenkin 2008), particularly in uncertain situations (Harorimana 2009; Mahdi, Almsafir & Yao 2011; Moghaddam, Mosakhani & Aalabeiki 2013). Knowledge management has been generally conceptualised as a process or approach for the

identification, collection, organization, creation, storage, sharing, dissemination and implementation of knowledge in order to improve organisational performance and resilience to achieve the organisational goals (Akhavan, Atashgah & Sanjaghi 2012; Fani & Fard 2015).

It is argued that in today's complex and competitive environment, tangible factors or resources (i.e. investment in capital, labour and raw materials), are no longer the leading factors to enterprise success but rather the focus is on how to harness intangible resources such as knowledge for improved organisational performance and the organisations' ability to create and share this knowledge and manage innovation (Matayong & Kamil Mahmood 2013), suggesting a shift from tangible to intangible resources which is further supported by the existing literature (Wu & Wang 2006).

For many companies and enterprises, knowledge management has emerged as a growing field of practice and research. It has become an important aspect for organisational success and as such has largely secured a prominent position in the era of the competitive business environment. According to Thomas, Kellogg and Erickson (2001), knowledge management began as a corporate strategy for integrating information and communication technology applications and human resources in the pursuit of better organisational performance. It addressed some key enquiries of human resource development and also initiated new debates on current human resource development practices (Thomas, Kellogg & Erickson 2001b).

Since the inception of the knowledge-based view of an organisation, with its emphasis on intellectual and dynamic capabilities, knowledge and its proper management in organisations has played a key role in what makes organisations high performing, competitive and resilient (Honyenuga, Tuninga & Ghijsen 2016).There is a great body of literature which shows that the effective management of knowledge creation and sharing can promote learning and innovation, boost the efficient use of scarce resources, such as time and budget, and contribute to competitive advantage, organisational performance (Edwards, Collier & Shaw 2005; Wang et al. 2016) and resilience (Akgün & Keskin 2014; Buliga, Scheiner & Voigt 2016; Godwin & Amah 2013).

In view of the roles attributed to knowledge management, ownership and the effective management of knowledge resources has become fundamental to managers of

organisations who are determined to drive change and improvement by looking for new ways to help their customers improve their satisfaction, increase their profits, achieve high performance and become resilient to the new situations or challenges they will face over time. It is for this reason that knowledge might be interpreted as 'power' for some and they may or may not share it (Chan & Garrick 2003). Dana, Korot & Tovstiga (2005) argue that to possess such power and to apply it to create value for the organisation, managers should integrate information from multiple sources, skills, experience, intuition and lessons learnt into their practices. This way, we can describe the organisation as one having knowledge which is essential for goal accomplishment.

Recent studies in the area of knowledge management, organisational performance and resilience enhancement programs have identified the leading role of knowledge management in developing a culture of resilience and performance throughout organisations (Akgün & Keskin 2014; Buliga, Scheiner & Voigt 2016; Fani & Fard 2015; Honyenuga, Tuninga & Ghijsen 2016; Matayong & Kamil Mahmood 2013; Nafei 2016; Singh 2014).

Some researchers argue that knowledge management is a critical factor in achieving a competitive advantage, and they have documented that knowledge management practices have a direct association with various intermediate measures of (strategic) organisational performance. Gold & Arvind Malhotra (2001), for example, discovered a strong and significant correlation between both knowledge infrastructure and processing with organisational effectiveness, suggesting that knowledge management practices are positively linked to organisational performance.

Lee & Sukoco (2007) also came to the same conclusion and noted the significant effect of knowledge management capabilities on innovation and organisational effectiveness. Donate & Guadamillas (2011) came to the similar conclusion and noted that knowledge management has the potential to create a coordinating mechanism that can improve the capabilities of organisations and place them in an enhanced performance status. Yet, very little evidence was found on the role of the knowledge creation processes on the performance of commercial banks in Saudi Arabia.

Other research scholars argue that in today's complex and uncertain environment, only dynamic business organisations that can adapt to change can survive. In a series of

research investigations, a significant correlation between knowledge management and organisational resilience was found (Fani & Fard 2015; Godwin & Amah 2013; Lengnick-Hall, Beck & Lengnick-Hall 2011; Mafabi, Munene & Ntayi 2012). More specifically, these authors disclosed that knowledge creation and sharing enhance organisational adaptation, resourcefulness and learning. For them, resilient organisations are capable of leading and turning threats into opportunities, coping with unexpected and uncertain circumstances in real time and growing well in a dynamic and volatile economic situation. Yet, despite the organisations' growing interest in knowledge management, few financial institutions have succeeded in constructing a knowledge-based competence to gain and establish resilience.

Most of the above studies however have been constrained by models or methodologies that have a limited ability to manage knowledge in practice and synthesise different types of knowledge (tacit and explicit), and multiple modes of knowledge conversion i.e. socialisation (tacit to tacit), externalisation (tacit to explicit), combination (explicit to explicit), and internalisation (explicit to tacit), which is also known as the SECI framework (Nonaka 1994; Nonaka & Takeuchi 1995; Nonaka, Toyama & Konno 2000), into a holistic picture. While it has been recognised that organisational performance and resilience are largely dependent on the proper implementation of knowledge creation and sharing, previous research into organisational performance and/or organisational resilience has not comprehensively considered the role of knowledge management. Very little is known about the mediating role of organisational performance and resilience in the relationship between knowledge management and each of these variables in the banking industry.

There is a growing body of literature on knowledge management, reflecting its critical importance to modern organisations. However, the association between knowledge management and organisational performance and resilience has not been fully addressed, most likely because the evaluation of its impact on business performance and resilience has remained a difficult challenge. While there is evidence that financial institutions are becoming increasingly aware of the benefits of knowledge management (AlAmmary & Fung 2008), only a relatively small proportion of banks have implemented knowledge creation strategies and initiatives.

Research scholars are of the view that organisations that successfully produce, store,

process, share and manage knowledge are those that outperform their competitors (Hart & Banbury 1994), ensuring survival and success. They, for example, note that to achieve such a superiority, organisations need a range of knowledge resources and knowledge management capabilities to be able to achieve success and competency in the marketplace (AlAmmary & Fung 2008; Borgonovo 2006; Borgonovo & Peccati 2004; Nonaka 1994). Yet, researchers often suggest that because of the emergent nature of knowledge management and its newly emerging trend in business, more empirical studies on the relationship between knowledge management and organisational performance and resilience are needed (Alavi & Leidner 2001; Jansen, Van Den Bosch & Volberda 2006). Such a suggestion partly derives the motivation for this study in the banking industry where we believe research on these issues is limited.

There are many knowledge management theories and models presented in the literature which business organisations and corporates can choose to foster knowledge creation and sharing in their pursuit of enhanced organisational performance and resilience (Nonaka, Von Krogh, & Voelpel, 2006); however little was found about how these models or theories relate to enhanced organisational performance and resilience in the banking system. Nonaka and colleagues' (1995; 2000a) theory of knowledge management is one of the leading theories in this area (Virtanen, 2011) and is based on the assumption that knowledge is created and shared through social interaction. It proposes that there are four ways in which two types of knowledge i.e. explicit and tacit knowledge can be produced, combined, shared and converted to (re)produce new knowledge as outlined in the SECI framework (Nonaka, 1994; Nonaka & Takeuchi, 1995; Nonaka et al., 2000b).

Nonetheless, existing research has largely focused on Nonaka et al.'s knowledge management within the context of business organisations but outside the domain of banking system. While Nonaka and Takeuchi's knowledge conversion theory has been generally used in business, its application in the banking industry has been very limited. What remains unclear is whether or not and how Nonaka and Takeuchi's knowledge conversion theory is applied to the banking system in Saudi Arabia, and their performance and resilience in practice. The previous literature demonstrates that the knowledge creation process based on Nonaka et al.'s model adds to the dynamicity of any organisation (Qi & Chau 2016). Ng, Leung & Lo (2017) also argued that models like

Nonaka's KCP have great potential for organisations as they tend to provide dynamic frameworks for the process of KM in any organisation. The results of their research showed that organisations that have used Nonaka's knowledge creation process or model are more capable of creating and sharing knowledge than those without such a model, documenting the relevance of knowledge management to organisational success. Yet, the available literature on knowledge management has not deeply investigated the role of Nonaka et al.'s knowledge creation process in organisational performance and resilience within the banking industry, particularly in Saudi Arabia.

Within the area of organisational development, sustainability, change and management, mere 'knowledge' no longer stands out as a sufficient factor that can lead to improved business performance and resilience. For a business to achieve enhanced performance and optimum results, and to remain competitive, innovative and resilient, knowledge needs to be created and managed properly as a shared asset (Darroch 2005). This makes knowledge creation a source of organisational resilience and a key factor in integrating theory into practice and delivering better business performance. Many studies have already established an association between knowledge management and organisational performance and/or organisational resilience (Alrawi & Elkhatib 2009; Byukusenge, Munene & Orobia 2016; Lee & Roth 2008). Yet, almost all of these studies have been conducted outside the Saudi-Arabian context which are limited to the non-banking industry and limited to knowledge management as an explanatory variable to business performance or organisational resilience. While there are published studies on the association between knowledge management and single factors e.g. organisational performance or organisational resilience in isolation as documented above, they are predominantly outside the domain of the banking industry. To the best of our knowledge, this study represents the first attempt to investigate the relationship between knowledge management and both organisational performance or organisational resilience in the banking system. In addition, the literature has not fully investigated the mediating role of organisational performance or resilience in their relationships with the knowledge creation process and each other through a single study of the banking industry, nor did we find any relevant article in the Saudi Arabian context.

This empirical research provides insights into this by investigating the relationship between the knowledge creation process, organisational performance and organisational

resilience within the Saudi Arabian banking industry. The gap that this study attempts to fill is to examine whether or not knowledge creation processes, as described by Nonaka et al., contribute to organisational resilience and performance in the Saudi Arabian banking system, and which factors combine with knowledge management to enhance the performance and/or resilience of the banking organisations within an emerging market in this country. It seeks to make a contribution to the current body of literature on organisational performance and the resilience of the banking industry, more so in the Middle East and particularly in Saudi Arabia, where there is not much research on the relationship between knowledge management, business performance and/or organisational resilience.

In a developing country like Saudi Arabia, there are signs of competitive advantage and improved efficiency and productivity within the national and international financial network through knowledge management practices (Alabdan & Callen 2016; Int'l Business Publications 2013); however whether such knowledge management initiatives are practised to improve organisational performance and resilience in Saudi Arabian banks is still to be explored. Surprisingly, it is a general belief that some Saudi Arabian bankers do not implement the power of knowledge in their banks, rather adhering to the traditional governance of their institutions. Very little empirical research exists on this line of investigation in developing countries, especially Saudi Arabia. Due to the lack of research studies on knowledge management strategy, business performance and organisational resilience in the Saudi Arabian banking industry, this empirical research hopes to contribute to the debate in the literature related to the service sector in general, and to the banking sector in particular as to which indicators, combined with knowledge creation process would critically ensure improved organisational performance and resilience. Therefore, for the current research, knowledge management practices support the creation and sharing of knowledge as a critical factor for better performance and resilience in the banking industry.

Saudi Arabia has been chosen as the focus of this study due to its complex banking system. For example, the current state of information and communication technological infrastructure employed in Saudi Arabian banks is somewhat basic and inadequate information on those organisations complicates matters (Alabdan & Callen 2016; AlAmmary & Fung 2008). The publicly available information is not sufficiently reliable

or extensive enough to permit the evaluation of business performance or allow an estimation of their resilience in practice. The banking system in Saudi Arabia is regulated by the Saudi Arabian Monetary Agency. While this is believed to be a transparent legal, regulatory accounting system in the Saudi Arabian banking sector and that it is consistent with international norms (Int'l Business Publications Inc., 2013), its performance and resilience to ever-changing global changes and uncertainties has been poorly studied.

The life of the banking industry is full of uncertainties and risks where no result can be predicted accurately. Such uncertainties may be a consequence of a lack of observation or measurement, a lack of understanding or knowledge of obtainable facts and so on (Baghbanian 2011; Baghbanian et al. 2012; Gruszczynski 2010).In the face of these uncertainties, if the Saudi Arabian banking sector is to survive in the current unstable economic conditions and secure its sustainability in the future, it needs to depart from its comfort zone, learn from past experiences and do things differently with a focus on the proper knowledge creation and sharing (Alrawi & Elkhatib 2009). Given this background, this study investigates the influence of knowledge creation on organisational performance and resilience. It also examines the mediating effect of organisational resilience in the relationship between knowledge creation and organisational performance in the Saudi Arabian banking system.

2.6   Chapter Summary

This review revealed the concepts and processes of knowledge, knowledge management, organisational resilience and performance. Knowledge was discussed as a valuable organisational asset and was differentiated from concepts of data and information. Two types of knowledge, tacit and explicit, were discussed, followed by Nonaka et al.'s theory of knowledge creation where the two types of knowledge are converted into the different modes of socialization, combination, externalization and internalization. The four aspects of organisational resilience, adaptability, robustness, agility and innovation were also discussed. The balanced scorecard with its four aspects of financial, customer, internal business, and growth and learning measures was also described as a basis for

data collection and measurement in the present study. The chapter gave a brief justification for using the BSC as measurement for organisational performance. The latter part of this chapter identified and discussed the research gap related to this study. The contribution of knowledge creation and sharing to organisational resilience and performance was reviewed to explore the unknown aspects of the study with a focus on the banking industry in Saudi Arabia.

CHAPTER 3 : THEORETICAL BACKGROUND AND RESEARCH MODEL

This chapter provides a detailed overview of studies on the concepts and theories relevant to knowledge management and organisational knowledge creation, followed by a discussion of the literature focusing on organisational resilience and organisational performance. It demonstrates the (elements of) knowledge creation that may influence different aspects of organisational performance and organisational resilience. This chapter also discusses the significance of knowledge management in organisational performance and organisational resilience in the Saudi Arabian context. Finally, the chapter concludes with a critical analysis of the current literature and clarifies the research gap, followed by a discussion of the conceptual framework of the current study. A conceptual model/framework is developed based on the theoretical foundations rooted in the previous literature. Hypotheses are developed afterwards.

3.1 Knowledge Creation process

Within the knowledge management literature, Nonaka's theory of organisational knowledge creation/conversion, focusing on the SECI model, is perhaps one of the most widely accepted theories of knowledge creation and sharing. At the heart of Nonaka's theory, knowledge is classified into two types: tacit knowledge and explicit knowledge. Tacit knowledge residing in individuals' minds, encompasses creative processes, understanding future states, values, instincts, hunches, intuitions, insights, perspectives, beliefs, skills, know-how and personal experience (Dyck et al. 2005; Frappaolo 2008; Sabherwal & Sabherwal 2007). Noe (2002, p. 167) described tacit knowledge as the personal knowledge rooted in individual experience which is primarily affected by values and perceptions. Nonaka (1994, p. 16) also elaborated that tacit knowledge is intensely entrenched in involvement, commitment and action in a particular context, and added that it may incorporate elements of cognition and technical consideration. The cognitive elements include working models of reality - viewpoints, beliefs, mental models and personal schemata, which enable people to create their perspectives of understanding and defining their environment. The technical components are best described as 'know-how'.

Explicit knowledge, also known as codified or visualized knowledge, on the other hand, can be conveyed through formal, systematic language (Nonaka 1994, 2007; Nonaka, Von Krogh & Voelpel 2006; Weiss & Prusak 2006). It is often expressed in clear language, formatted in the minds of individuals, thus it can be sealed in a knowledge database or managed through a system of knowledge management (de Carvalho 2001; Noe 2002).

Organisational knowledge creation is usually based on the two dimensions of interaction and conversion. The first dimension is related to the interaction between explicit and tacit knowledge. The second dimension relates to the transfer of knowledge from individuals to groups and further to organizations (Nonaka & Takeuchi (1995). By combining these two premises, the authors developed a model for knowledge creation and sharing based on the four processes of socialization (tacit to tacit), externalization (tacit to explicit), combination (explicit to explicit), and internalization (explicit to tacit). The socialization process explains social interaction as a basis for tacit to tacit knowledge transfer and linking, with a focus on sharing tacit knowledge in-person and through experiences. When interacting with each other, individuals can obtain tacit knowledge through imitation, observation, and mentoring as well as active practice and create shared mental models and technical skills.

Externalization (publishing, articulating knowledge) is the initial step in having tacit knowledge transformed into explicit knowledge through developing factors that can embed the combined tacit knowledge which enables its communication. Metaphors, concepts, models, images, analogies, written documents and hypotheses support this kind of interaction.

When tacit knowledge is made explicit e.g. when concepts are developed by discussion and shared reflection, knowledge is formed and articulated, thus allowing it to be shared between and among people, and it becomes a basis for creating new knowledge (Linderman et al. 2010). Considering a process improvement perspective, externalization practices enable people to express their implicit and unspoken concepts and ideas explicitly. The expressions can be in the form of language and/or visual schemata. Such practices transform the tacit language that individuals in a team hold into explicit forms such as diagrams, numbers, pictures and written descriptions which then contribute by enabling group analysis and discussion (Anand, et al., 2010; Bohn, 1994; Hansen, Nohria, & Tierney, 1999).

The combination process of knowledge conversion explains organizing and integrating different kinds of explicit knowledge where knowledge is transformed from explicit knowledge to explicit knowledge, for example building prototypes. It involves the utilization of information technologies and social processes in combining various parts of explicit knowledge that information systems store or individuals hold. The exchange and combination of explicit knowledge among individuals take place via exchange mechanisms and the creative utilisation of computer-based technologies and networks as well as large-scale databases that can support explicit knowledge conversion, such as telephone conversations, meetings and emails. Usually, explicit knowledge is acquired from inside or outside the organisation and is then combined, adjusted, edited and/or processed to build new knowledge. The new explicit knowledge is then disseminated among individuals across the whole organization.

Internalization is the transformation process of explicit knowledge into tacit knowledge, where knowledge received by an individual is applied to practice. Knowledge acquisition in the internalization process is a learning-by-doing process (enclosed by learning by doing), suggesting that explicit knowledge becomes part of an individual's knowledge and will be considered as an asset for organizations. In other words, internalization involves individuals absorbing tacit knowledge through organisational and group explicit knowledge.

While each of these four modes of knowledge conversion might create knowledge independently, organisational knowledge creation only happens when all the four modes dynamically interact and are organizationally managed. This highly repetitive process constitutes a 'knowledge spiral' that occurs through informal networks of relationships and transfers at individual, group and organisational levels, resulting in a spiralling effect of knowledge accumulation and growth. The appropriate application and management of the SECI framework in organizations has presented more opportunities for creating and sharing knowledge in practice (Nonaka, Toyama & Konno 2000).

3.2   Organisational Resilience

The concept of resilience, originating from the Latin resilire – 'to leap back'–, has been employed in a wide variety of academic disciplines, such as ecological science,

psychology, systems engineering, organisational sciences, economics, disaster management, management, security, and supply chain management (Bec & Dredge 2014; Coaffee 2013; Duijnhoven & Neef 2014). It has been viewed from different perspective and has been given a diverse range of definitions to suit the contexts in which it is applied. From a system perspective, Boin, Comfort & Demchak (2010) defined resilience as "the capacity of a social system (e.g. an organization, city, or society) to proactively adapt to and recover from disturbances that are perceived within the system to fall outside the range of normal and expected disturbances" (p.9). Along similar lines in organisational science and theory, some researchers refer to resilience as the ability to maintain positive adjustments under challenging conditions or to maintain desirable functions or outcomes in the midst of stress, crisis and strain (Luthar, Cicchetti & Becker 2000; Sutcliffe & Vogus 2003). Mallak (1998) saw resilience as an individual, group or organization's ability to expeditiously develop and conduct positive adaptive behaviors corresponding to the immediate conditions, while enduring the minimum tension (p. 148). Walker et al. (2004) defined a system's ability to absorb disturbance and adjust while undergoing change so as to still retain essentially the same in terms of function, structure, identity, and feedback (p. 2). All previous definitions revolve around the idea of an organization's ability to either build the capacity to foresee and prevent a disaster, or reinvent themselves after it. What is clear is that these definitions of resilience do not solve all the questions raised over time, even though they have the potential to bring together empirical research that deals with the different aspects of resilience.

In the organisational context, resilience has also been defined as the capacity of an organization to survive, adapt, and grow in the face of uncertain conditions (Bhamra, Dani & Burnard 2011; Lengnick-Hall, Beck & Lengnick-Hall 2011). Zaato & Ohemeng (2015) define organisational resilience as an organization's capability to anticipate key events from emerging patterns/trends, constantly adapt to change, and rapidly recover from adversity, when it occurs. The dynamic capacity of an organization is to continually cope with unanticipated dangers and adapt to change after they have become manifest, growing and developing over time and learning to bounce back (Wildavsky 1988).

From a business perspective, Robb (2000, p. 27) states that a resilient organization is one that can sustain a competitive advantage over time through its capability to simultaneously do both, delivering excellent performance against current organisational goals and effectively innovating and adapting to rapid, turbulent changes in markets and

technologies. For the author, the organization's ability to defeat competitors in a fluid and unpredictable environment reflects its resilience. However, a variety of factors, capabilities and mechanisms and degrees of variations exist that may contribute to the creation of resilient organizations. Zang and Liu (2012) identified three major features that contribute to organisational resilience: the ability to self-organize, the capacity for learning and adaptation in the context of change, and the ability to absorb or defend against disturbances yet maintain its core functioning. Likewise, Vossen (1998) identified three major characteristics that relate to the resilience of a small organizations: adaptability, innovation and flexibility. In a similar vein, Fiksel (2003) suggested a number of characteristics that subscribe to resilience, including adaptability, efficiency, diversity, and cohesion. Madni & Jackson (2009) proposed the three characteristics of robustness, adaptability, and agility that form resilience. McManus et al. (2008), however suggested other features that can enhance the organization's resilience, including the ability to improve the adaptive capacity, situational awareness, and the management of keystone vulnerabilities. Likewise, for Sanchis and Poler (2013), resilience is identified through the three components of adaptive capacity, vulnerability, and recovery ability. Zaato & Ohemeng (2015) proposed four characteristics for resilient organizations: leadership, organisational design, adaptive capacity, and employees' involvement. In the current study, the review of the literature resulted in the identification of the four factors of innovation, agility, adaptability, and robustness as the key resilience capabilities (Chu 2015; Erol, Sauser & Mansouri 2010; Fricke & Schulz 2005; Kantur & İşeri-Say 2012; Oh & Teo 2006; Singh 2014). Adaptability is described as the capability of an organization to continuously adapt and adjust to changes in the face of change environments while innovation is the ability to offer a variety of innovative products and services rapidly; whereas agility is the ability of an organization to continually sense the business environment for threats and opportunities and respond quickly and successfully.

3.3 Organisational Performance

Improving organisational performance, even though not an easy task, is the prime focus of all organizations. Performance improvement however is dependent on active support and the productive contribution of a wide array of activities, factors and behavior. To successfully promote organisational performance, it is important for an organization to develop a comprehensive measurement index that provides its executives and staff with

a clear direction and well-developed objectives (Tseng & Lee 2014). Organisational performance is an indicator of the extent to which organizations achieve their goals/objectives (Ho 2008). In all organizations, an organization's management relies mainly on the ability to measure performance, so that they can assess and report on their performance.

Traditionally, organisational performance has been largely evaluated based on financial measures. The most widely utilised financial measures are return on assets (ROA), return on investment (ROI), return on equity (ROE), sales growth, market share and profitability. A review of the literature indicates that although these measures are important indicators of an organisation's profitability and most often exhibit the definitive aim of the organisations' operations, relying solely on these measures is not suitable for the competencies for which contemporary organisations are looking (Gomes, Yasin & Lisboa 2004). Therefore, organisations have been required to measure their performance qualitatively.

Kaplan & Norton (2001) state that although business organisations are keen to keep track of their intangible assets, they face two problems in measuring them as follows: (1) the value from intangible assets is indirect, and (2) the value varies in different organisational contexts. The attempt to capture intangible assets is important because it is impossible to manage them without knowing what they are. Knowing what the intangible assets are, organisations can then manage them to deliver value.

Organisational performance has been viewed as a multidimensional construct (Richard et al. 2009). Kaplan & Norton (1996) observe that financial measures cannot be considered as the only indicators of how well a business organisation is performing. The organization's performance can only be completely assessed if its various dimensions are taken into consideration (Tangen 2003). Organizations can only perform well when all the system components, people, operations, customers, management and partners are integrated and interconnected (Tangen 2003). Furthermore, it is claimed that future performance can be predicted in a more efficient way if non-financial measures are also employed in the organisations' performance measurement (Tangen 2003). It is critical to use a tool that can measure organisational performance comprehensively. The balanced scorecard metric has been designed to be a powerful measurement tool for achieving

strategic planning and alignment as it integrates both financial and non-financial aspects of organisational performance (Huang 2009; Kaplan & Norton 1996; Niven 2010).

A balanced scorecard compared with traditional financial measurements is a more complete measure of organisational performance. It includes four perspectives: the financial perspective, the customer perspective, internal business process perspective, and the learning & growth perspective. According to Huang (2009), and Kaplan & Norton (1996), organizations can link long-term strategic objectives to short-term actions by combining financial and non-financial measures, which in turn, will enable their managers to consider various reciprocal relationships and causal effects. In the context of this research study, the concept of Kaplan and Norton's balanced scorecard (1996) is applied to measure organisational performance since it enables a thorough evaluation of organisational performance, using both the perspectives of financial and nonfinancial.

A close review of the current literature disclosed that knowledge creation processes are critical to various components of organisational resilience and performance in specific contexts, for example in business (Byukusenge, Munene & Orobia 2016; Chung et al. 2012; Firestone et al. 2005; Darroch 2005). The application of knowledge management in the performance of financial systems including banks however has been under-researched.

The review recognized the critical areas in organisational knowledge creation, organisational resilience and performance research and evaluated the relationship between these variables. However, very little was found about the influence of knowledge management on organisational resilience and performance in the banking context, especially in the Saudi-Arabian banking industry. The review of the literature increased the researcher's theoretical sensitivity, and helped the researcher verify certain assumptions and conclusions. It confirmed that few empirical research studies have been conducted on knowledge creation, organisational resilience and performance in the banking system. While single studies in other contexts exist, they provide no comprehensive framework or holistic understanding that allows the empirical investigation of the influence of knowledge creation on organisational resilience and performance in the banking industry in Saudi Arabia, which is a main goal of this study. The review of the literature however revealed a number of models and frameworks that address one or more aspects of the present research study, which later guided the

researcher's choice of the preliminary conceptual model and suggested variables to consider in this model.

3.4   Conceptual Model

The review of the literature identified several factors, activities, processes, and relationships that are represented in the preliminary conceptual model. The preliminary conceptual model of this study is presented below. The model and its constructs are not intended to be a concrete reality or a representation of the phenomenon itself. Instead, the model reflects an analysis of the researcher's past experience with and observation of knowledge and organisational management, and particularly, his current knowledge and assumptions about knowledge creation, organisational resilience and performance. Below in Figure 3.2, we describe how these variables and their components are linked together.
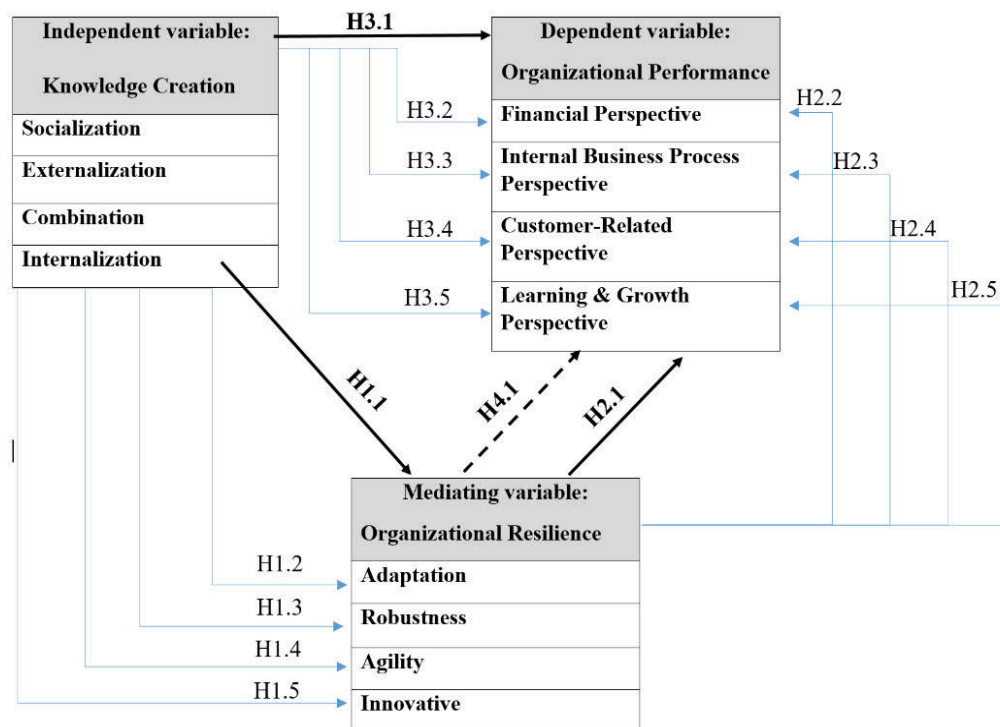
Figure 3.1: Research Model

3.5   Hypotheses Development

In relation to research questions, the following hypotheses were developed to guide this study.

3.5.1   Knowledge Creation process and Organisational Resilience

Organizations are constantly facing challenges and complexities every day due to the changes that frequently occur in the business environment. In complex and uncertain situations, organisations are required to be flexible, adaptable and creative enough to respond to changing conditions which implies their resilience capacity. As noted above, in the context of organisational studies, resilience is defined as the capacity of an organization to survive, adapt to change, and grow in the face of uncertain conditions (Bhamra, Dani & Burnard 2011; Lengnick-Hall, Beck & Lengnick-Hall 2011). Organizations that strive to be resilient have several key capabilities, including innovation, agility, adaptability, and robustness (Chu 2015; Erol, Sauser & Mansouri 2010; Fricke & Schulz 2005; Kantur & İşeri-Say 2012; Oh & Teo 2006; Singh 2014). Adaptability is described as the capability of an organization to continuously adapt and adjust to changes in the face of changing environments while robustness characterizes the ability of organization to absorb and withstand disturbances and crises without excessive damage. Innovation is the organisation's ability to offer a variety of innovative products and services rapidly while agility is the ability of an organization to continually sense the business environment for threats and opportunities and respond quickly and successfully.

The growing challenges in organisational life have increased the awareness and interest of academics and industrialists about the importance of building resilient businesses or organizations which are able to absorb an event that necessitates change, to adapt and continue to maintain their competitive edge and profitability. In this context, knowledge management is recognized as a primary factor that can enhance organisational resilience, and this has been established in the literature (Duffy 2000; Fani & Fard 2015; Fani, Fard & Yakhkeshi ; Godwin & Amah 2013; Niu 2010). Mafabi, Munene & Ntayi (2012), and Godwin & Amah (2013) for instance affirmed that that knowledge management has been positively and significantly associated with organisational resilience. They concluded that in increasingly uncertain business circumstances, knowledge management can play a significant role in improving the business organization's resilience. In the same vein,

Fani & Fard (2015) with an intention to understand the mediating effect of knowledge management in the relationship between organisational learning and organisational resilience in public Iranian organizations, concluded that there was no direct effect of organisational learning on organisational resilience, except through the full mediation of knowledge management. The authors argued that it would be difficult to improve the resilience of Iranian organizations without knowledge management. In the present research study, we argue that if organisational resilience is positively affected by knowledge management, it is reasonable to assume that a similar relationship may exist between the knowledge creation process and organisational resilience and its sub-factors in the banking system as outlined below.

3.5.1.1 Knowledge Creation process and adaptability

For organisations to adapt to their surroundings, it is necessary to have some knowledge of the changing environment and the influence it may have on them including their performance. Proper knowledge management will motivate staff and enhance collaboration amongst them (Sveiby and Simons 2002). It will encourage them to use applicable knowledge to solve the problems facing their organisations. The organisations' environment however should be flexible which can accept change, giving it the strength to prevent being influenced by the changing environment (Freeze, 2006). Senge (2006) described the significance of organisational adaptability when change poses a threat to the organisation. He also supports the fact that adaptability is constant in which the employees learn to adapt by making use of knowledge creation, utilisation and sharing.

Several studies explore the relationship between knowledge management and adaptability. Niu (2010) empirically investigated the effect of knowledge management processes on a company's ability to adapt to external environmental changes, using the data obtained from 170 high technology companies in China. The findings revealed that knowledge management processes are significantly associated with adaptability. Mafabi, Munene & Ntayi (2012) also found a positive correlation between knowledge management and the adaptability dimension of organisational resilience. In another empirical study, Godwin & Amah (2013) investigated the influence of knowledge management processes on adaptability, their results indicating that knowledge sharing and utilization are positively correlated with adaptability, while knowledge acquisition

and storage are negatively correlated with adaptability. Similarly, Fani & Fard (2015) investigated the impact of knowledge management as a mediator factor in the relationship between organisational learning and organisational resilience (conceptualized as adaptability and resourcefulness) in Iranian public organizations, using survey data collected from 270 middle and senior managers of 28 public organizations in Iran. Their findings showed that knowledge management has a positive, significant relationship with organisational resilience. The study results however found no direct effect of organisational learning on organisational resilience, except through the full mediation of knowledge management. Based on this result, they suggested that it would be difficult to improve the resilience of Iranian organizations without knowledge management. Memon's (2015) empirical research on Pakistani banks also investigated the relationship between the SECI knowledge creation process and adaptability, and indicated that the four modes of SECI knowledge creation have a positive influence on organisational adaptability. Given the above information, we believe there is sufficient evidence to postulate that knowledge management plays a major role in enhancing the resilience capabilities of organizations in the face of changes in the business environment.

3.5.1.2   Knowledge Creation process and Robustness

Robustness, as a property of organisational resilience, has been documented to associate with knowledge management practices. Robustness in the light of this research has been defined as an organisational ability to quickly react to non-standard variations. Existing research shows that learning provides organisations with the necessary robustness against the uncertainties they face. In a paper presented by Valiant (2008), the author argues that any theory of commonsense knowledge and reasoning employed by intelligent systems would fail if it doesn't integrate mechanisms, in the manner of knowledge infusion, that guarantee the robustness of the decisions made by the system (Valiant 2008b). This also shows that organisations seeking resilience and robustness can create effective strategies to address the environmental risk and crises they face (Oluwasoye & Ugonna 2015). In law enforcement research, it has been also argued that organisational resilience and robustness are supported by knowledge management, particularly for digital investigations (Amann & James 2015). However, scant work has

looked at the relationship between knowledge management and robustness in social settings, such as the banking industry.

While the concepts of organisational resilience and robustness have been documented to link to various domains in, for example, risk management or quality management, we believe that knowledge management is also of specific relevance to resilience and robustness in the banking industry. It is therefore proposed that robustness is influenced by the capacity and the extent to which an organization can create and share knowledge to distribute damage and adapt to change. It is however important to note that although robustness is sometimes kept as a separate attribute, for the purpose of the current study, robustness, or the ability of a system to resist change, is considered to be a part of organisational resilience as usually covered in the literature.

3.5.1.3   Knowledge Creation process and Agility

Agility is essential for organisations to enhance their innovative practices and competitive performance in contemporary business environments. Organisations which rely on knowledge management systems and practices, including information technologies, are more capable of enhancing their agility. The knowledge creation process renders a greater reach and richness in information and knowledge which enables the agility capacity of organisations (Sambamurthy et al., 2003). Existing research argues that when knowledge is moulded externally, the organisation can accurately recognise the relevant change in their surroundings such as market opportunities and changing customer needs. It can also bring about the required action after the situation has been comprehended. The speed and the efficiency through which the change is perceived and comprehended are the keys to organisational agility. Internally, the reach of the knowledge and richness promotes a closer integration and coordination across operational units. The high level of coordination gives rise to the ability of the organisation to respond very quickly to any change occurring in the immediate surroundings of the organisation (Sambamurthy et al., 2003). A solid knowledge base made through the constant supply of knowledge from authentic knowledge creation processes gives the organisation small and short-run advantages. This advantage gives the organisation an extra edge over its competitors in a timely manner (D'Avenie 1994). There is wide support in the literature to show that agility becomes stronger with greater knowledge influence and abundance promoted by the knowledge creation process

(Chung et al. 2012; D'Aveni 2011; Liu, Song & Cai 2014; Sambamurthy, Bharadwaj & Grover 2003). Chung et al. (2012), for example, conducted a study to examine the effect of the knowledge creation process on an organisation's agility (customer agility and operational agility), and the role of agility as a mediator on the relationship between knowledge creation processes and an organisation's performance. The study findings revealed that knowledge creation has a positive influence on its agility capability. The results also show that the agility capability significantly and completely mediated the relationship between knowledge creation and the organisation's performance. On the basis of the results of the study, the authors suggested that a focus on implementing knowledge creation processes could be the best strategy to improve organisational agility. They further called for more research into how knowledge creation enhances the agility level of the organization and creates strategic value.

In this research study, we also asserted that knowledge creation and sharing enhance organisational agility.

3.5.1.4 Knowledge creation process and Innovation

There is well-known evidence that innovative ability is the backbone of a company's survival in the market and against its competitors (Porter, 1986). There are a number of factors which enable innovation, according to several studies. A consensus of these studies shows that the main driving force for innovation inside a company comes from its ability to absorb knowledge innovation (Nonaka and Takeuchi, 1995; Ramirez and Kumpikaite, 2012; Sankowska, 2013).

The degree of innovation can also be estimated by the amount of knowledge acquired and applied, according to Hall and Andriani's study (2003). The effects of both tacit and explicit knowledge on the efficiency and quality of innovation are highlighted by Zahoori el al. (2013). In addition to this, Kluge et al. (2001) highlighted the importance of the impact of knowledge creation process speed on innovation success. According to Nonaka and Takeuchi (1995), the formation of knowledge through interaction and its dissemination and application acts as a catalyst for innovation. A constant knowledge creation process enables the recognition of opportunities and the formation of new ideas which leads to innovation (Popadiuk and Choo, 2006). The novelty of an idea depends on what kind(s) of knowledge one uses in its formation (explicit or tacit). Tacit

knowledge which is hard to transfer, can be communicated to others by passing it first through socialisation and then externalisation. These two modes create knowledge on the basis of new concepts and ideas, paving the way for innovation (Popadiuk and Choo, 2006). According to Schulze and Hoegl (2008), the process of socialisation is connected to the novelty of an idea. The authors argued that face to face, the informal interaction of individuals with completely different sets of perspectives, may make a new product or idea. This type of interaction, which yields different perspectives, can occur amongst the employees of an organisation or outside the organisation where the customers interact to create new products, which suit their needs. They also highlighted the importance of the process of combination and internalisation for exploitative innovation. According to Schulze and Hoegl (2008), innovation made through the use of explicit knowledge is usually incremental because it is only a recombination of the existing explicit knowledge. In addition to this, the authors regard the process of internalisation as one which has a good impact on the novelty of the product idea. The process of internalisation, according to the authors, improves the absorption of existing knowledge which in turn allows individuals to build new visceral knowledge and therefore develop novel ideas (Schulze and Hoegl, 2008). Binbin et al. (2012) stated that each dimension of the SECI model provides a significant success factor in relation to innovation for Chinese organisations. In line with these findings, Rafaey (2002) also found that the process of combination and externalisation has a positive effect on innovation.

Study hypotheses: Based on the above findings and discussions, the following hypotheses are developed for the purpose of the current study:

H1.1 There is a positive relationship between the knowledge creation process and organisational resilience.

- H1.2 There is a positive relationship between the knowledge creation process and adaptability.
- H1.3 There is a positive relationship between the knowledge creation process and robustness.
- H1.4 There is a positive relationship between the knowledge creation process and agility.
- H1.5 There is a positive relationship between the knowledge creation process and innovation.

3.5.2 Organisational Resilience and Organisational Performance

A detailed review of the literature also revealed an association between organisational resilience (and its components) and organisational performance.

3.5.2.1   Adaptability and Organisational Performance

To survive, organisations are required to have the ability to adapt to their ongoing changing environments but the capability of an organisation to adapt can have various effects on their performance (Oktemgil & Greenley 1997). Chakravarthy (1982) pointed out that there is a close relationship between the company's ability to cope with high levels of complexity and its high adaptability which increases its chances of survival in the long term. The previous literature indicates that there the adaptability of the organisational has a positive impact on its performance. The study conducted by Takii (2007) indicated that there was a significant relationship between adaptability, the average profit rate and the market value of an organisation. In the Nigerian banking industry, Amah & Baridam (2012) conducted a study to examine the relationship between adaptability and organisational performance, and found that adaptability is significantly and positively related to market share. The results of their studies were consistent with an earlier study conducted by Denison, Hooijberg & Quinn in 1995 (Denison, Hooijberg & Quinn 1995) who found a significant correlation between adaptability and sales growth. In contrast to the above results, Chu (2015) investigated the interrelationships between resilience capabilities and organisational performance and the moderating effects of turbulent environments on these relationships in SMEs located in Hong Kong, and found that an adaptability capability is significantly unrelated to organisational performance, both prior to and during turbulence. However, it has been established in the literature that too strong or too weak adaptability can lead to negative results on the organization's performance (Stoica et al. 2003). In their observation, Jahre & Fabbe-Costes (2005) indicated that the most adaptive organizations do not necessarily reach the highest level of performance as over-adaptation can make it harder to change as more elements are adapted to each other (Jahre & Fabbe-Costes 2005). Despite the conflict between the previous research findings, it is argued that the main aim of adaptability is to enhance organisational performance.

3.5.2.2   Agility and Organisational Performance

Organisations need to develop their agility capacity to be able to actively respond to accelerated and turbulent environments. Agility is strongly linked with competitiveness and resilience has a strong link with the profitability of an organisation According to McCann, Selsky & Lee (2009), the volatile behaviour of the environment can be restricted if the organisation is agile and resilient. Agility has the capacity to enhance an organisation's competitive actions and control market risk and unpredictability (Sambamurthy, Bharadwaj & Grover 2003). Oh & Teo (2006) stated that building organisational resilience as a strategic option can be achieved by enhancing the innovation and agility capabilities which gives the organisation an option to pursue new opportunities that will enhance their performance when the environment calls for them.

Prior research shows that an agility capability is associated with higher performance. Tallon & Pinsonneault (2011) found that agility is positively correlated with the financial performance of organisations operating in stable or volatile environments, but the contribution of agility to an organisation's performance was higher in volatile environments than in stable ones. Roberts & Grover (2012) also discovered a direct positive relation between agility and an organisation's market value, growth in sales, profitability and market share. They found that the high performance of the organization is strongly linked to high levels of customer-sensing ability and medium levels of responding ability. In the same vein, in a recent study conducted by Chu (2015), agility was found to have a positive influence on organisational performance (customer satisfaction and market effectiveness) in stable environments, and its differential influence is dependent upon the speed of response or timing to the extent and type of environmental disturbance.

However, it is important to note that agility in itself does not contribute to organisational performance in the sense of profitability, rather organizations must take a varied range of viable actions (Volberda 1996). The decision-making power of management should also be effective so that they can apply knowledge when making decisions (Handmer & Dovers 1996). Perlow, Okhuysen & Repenning (2002) stated that speed alone is not enough to contribute to improving performance attributes, such as time to market, quality, and cost effectiveness. In times of stress and unpredictability, an organisation

should have a number of options for consideration and should have the ability to effectively apply the knowledge they have to make appropriate decisions (Dove 1999b). The type, time and extent of the change which has occurred in the environment also determines which type of agility an organisation needs and what effect this will have on the organisation (Tallon & Pinsonneault 2011). Agility and resilience both seem to be domain-specific (Sambamurthy, Bharadwaj & Grover 2003) because both of them yield good performance if applied in turbulent conditions.

3.5.2.3   Robustness and Organisational Performance

An organisation's performance not only depend on resilience but also on robustness. If research scholars, practitioners and decision-makers can better understand the functionality of the organisational resilience and robustness model, environmental changes can be better managed and organisational performance will improve. It is argued that there is a high possibility of maintaining and nurturing a successful business once organisations realise the benefits of robustness and resilience (Oluwasoye & Ugonna 2015). The authors argue that in a highly competitive and changing environment, the implementation of a proper model of organisational resilience is critical to superior organisational performance. Usually, robust organisations are able to maintain or sustain high levels of performance in dynamic environments without having to change their organisational structures. Similarly, Visser (2002) argues that robustness measures the degree to which organisational performance changes as a result of environmental change. Robust organisations are more susceptible to changes in the environment and create less susceptible organisational performance (Oluwasoye & Ugonna 2015; Visser 2002). Given the above information, there is a possibility that robustness and organisational performance are linked within the banking system, even though no evidence has been found to verify this.

3.5.2.4 Innovation and Organisational Performance

Establishing a resilient organization is largely dependent on its ability to enhance its innovation and agility capabilities as these enable an organisation to pursue new opportunities that can help them improve their performance when necessary (Oh & Teo (2006). The authors stressed that enhancing an organisation's innovation capability ultimately leads to an increase in its market share and profits. The innovation-performance relationship has been demonstrated by many theories from several perspectives. Many previous studies have indicated that innovation has a positive impact on the performance of an organisation, both financial and non-financial (Cheng, Yang & Sheu 2014). For example, Oh & Teo (2006) conducted a study to investigate the relationship between organisational resilience (conceptualized as a construct comprising innovative capability and agility capability) and performance. Their study results revealed that organizations obtain resilience when they can sense environmental changes and respond quickly with innovations in services and products. They also indicated that organizations with a higher level of resilience capabilities achieve more superior performance under turbulent environments. In the same vein, Mazzanti, Pini & Tortia (2006) found that innovation and an organization's overall performance are strongly and positively related to each other. In the recent study conducted by Saunila, Pekkola & Ukko (2014), it was found that an innovation capability is significantly correlated with organisational performance.

To summarize, it has been established in the literature that innovative organizations have higher levels of productivity and economic growth than non-innovative organizations. Therefore, based on the prior literature, it is assumed that an innovative capability as a sub-factor of organisational resilience correlates with organisational performance.

Based on the above findings and discussions, the following hypotheses are developed for the purpose of the current study.

H2.1 There is a positive relationship between organisational resilience and organisational performance

- H2.2 There is a positive relationship between organisational resilience and the financial perspective.

- H2.3 There is a positive relationship between organisational resilience and the internal business process perspective.

- H2.4 There is a positive relationship between organisational resilience and the customer perspective.

- H2.5 There is a positive relationship between organisational resilience and the learning & growth perspective.

3.5.3 Knowledge Creation process and Organisational performance

Organizations are required to deal dynamically with their changing environment in order to maintain sustainability. In the past, problem-solving skills or information processing have been used to manage static environments, but this strategy alone in today's rapidly changing environments does not guarantee that organization will be able to provide adequate services and address complex issues. Therefore, for organizations to deal with complex and rapidly changing business conditions, they must transform and innovate (Edwards, et al., 2003; Gorelick & Tantawy-Monsou, 2005). Knowledge has been widely recognized as a strategic resource to obtain a competitive advantage and attain superior performance (Rusly, Yih-Tong Sun & L. Corner 2014). The ability of contemporary organizations to create and share their knowledge, which can enable them to innovate, is one of the most critical survival skills (Gold, Malhotra & Segars, 2001). Knowledge creation and sharing within an organization generally includes knowledge of the customer's needs, attitudes, and habits, as well as sharing expertise on product development, process improvement discoveries, and best practices, which improves organisational performance (Ngah[1] & Ibrahim 2010; Völkel & Haller 2009).

It is widely accepted that knowledge management processes are critical to an organisation's success (Ibrahim & Reid, 2010). Knowledge has an important effect on operating outcomes such as productivity, competitiveness, efficiency, innovation and ultimately organisational performance (Chen & Chen, 2007; Rusly et al., 2014; Volkel & Haller, 2009). Slavkovic and Babic (2013) for example examined the impact of the

knowledge management process (knowledge creation, knowledge transfer, and knowledge embedding) on innovativeness and organisational performance in Serbian companies. The results confirmed that knowledge management processes had a significantly positive impact on organisational performance. In South Africa, Kruger and Johnson (2011) explored the impact of knowledge management maturity on organisational performance. The authors defined knowledge management as knowledge maturity which includes knowledge capture, knowledge exchange, knowledge internalization and knowledge re-use, whereas organisational performance includes growth, profitability, intangible value, leverage, liquidity, customer satisfaction, employee satisfaction, and shareholder satisfaction. The findings of this study indicated that there is a direct correlation between organisational performance and knowledge maturity. In South Korean, Cho (2011) conducted a similar study to identify the empirical relationship between knowledge management capabilities and organisational performance (balanced scorecard approach). The study results revealed a positive relationship between the knowledge process capability and organisational performance variables. The results also showed that a negative correlation exists between the knowledge infrastructure capability and organisational performance. In the same vein, Valmohammadi & Ahmadi (2015) investigated the effect of knowledge management practices on organisational performance using the balanced scorecard metric. The results show that knowledge management practices have a positive and meaningful influence on the four organisational performance dimensions: financial, customer, growth and learning, and internal processes.

To summarize, it has been established in the literature that knowledge management plays a major role in enhancing organisational performance. Therefore, based on the prior literature, it is anticipated that the knowledge creation process correlates with performance in the context of Saudi banks.

Based on the above findings and discussions, we argue that the KCP from the perspective of SECI model has a positive relationship with organisational performance in the Saudi banking context as follows:

H3.1 There is a positive relationship between the knowledge creation process and organisational performance

- H3.2 There is a positive relationship between the knowledge creation process and the financial perspective
- H3.3 There is a positive relationship between the knowledge creation process and the internal business process perspective.
- H3.4 There is a positive relationship between the knowledge creation process and the customer perspective.
- H3.5 There is a positive relationship between the knowledge creation process and the learning & growth perspective.

3.5.4 The mediating role of organisational resilience in the relationship between knowledge creation process and organisational performance

The relationship between knowledge creation and organisational performance has been widely documented in the previous literature as reported in this chapter. The same connection was reported between organisational resilience and knowledge creation and organisational performance. It is also well-known that the association between human capital and organisational effectiveness is mediated through proper knowledge management practices (Zack 2002). Other researchers found that different aspects of knowledge management impact organisational performance (Tubigi, Alshawi & Alalwany 2013). However, whether or not the relationship between knowledge creation processes and organisational performance is mediated by organisational resilience has not been, to best of our knowledge, investigated. The relative importance of resilience as a mediator could then be statistically examined, which essentially involves determining the degree to which associations between antecedent (knowledge creation processes) and outcome variables (organisational performance) are changed after considering the shared variance between these and the hypothesized mediator.

H4. Organisational resilience mediates the relationship between the knowledge creation process and organisational performance

3.6   Chapter Summary

Concepts, models and theories of knowledge management, organisational resilience and performance were discussed to propose a conceptual model for the purpose of this study. The proposed model integrates the key concepts developed in Nonaka's (1994) knowledge creation process theory. The key dimensions of organisational resilience were identified in relation to organisational performance based on Kaplan and Norton's (1992) balanced scorecard dimensions. Several hypotheses were developed to test the research questions and/or the aims that guided this study. The research methodologies are discussed in Chapter 4.

CHAPTER 4 : METHODOLODY

The purpose of this chapter is to provide a discussion of the research methods used to conduct the study. The chapter contains seven major sections, namely, research philosophy, research design, development of the data collection tool and the operationalization of constructs, sampling and sample size, data collection, data analysis, and ethical considerations. The research paradigm section identifies and justifies the choice of the research philosophy underpinning the study. The second section, research design, contains a discussion of the overall research approach adopted in the present study. The third section, development of the data collection tool, details how the data collection instrument used in the study was developed. The fourth section, sampling and sample size, demonstrates how the research participants for the present study were recruited. The fifth section, data collection, contains a discussion on the administration of the questionnaire. The sixth section, data analysis, provides information on the statistical techniques used to analyse the data. The last section contains an overview of the ethical considerations and ethical approval.

4.1   Research Paradigm

A paradigm may be considered as a "set of values and techniques which is shared by members of a scientific community, which acts as a guide or map, dictating the kinds of problems scientists should address and the types of explanations that are acceptable to them" . The present study was grounded in the positivist research paradigm (Mingers 2003; Myers & Avison 2002; Ozanne & Hudson 1989).

Positivism helps in providing explanations and making predictions (Ozanne & Hudson, 1989). The basic assumption of positivism is that for social phenomena, a single, unchanging causal reality, that is independent of human experience, is in existence (Ozanne and Hudson, 1989). According to positivists Ozanne and Hudson (1989), social behavior is dependent on external factors and/or internal states which serve as objects accounting for the occurrence of behavior.

Positivism is deemed to be the philosophical orientation that is most suitable for the problem under consideration in the present study. In addition, the objectives of the present research require quantitative data to establish causal relationships between variables. Positivism makes it possible to obtain quantifiable data to test the hypotheses

and draw conclusions about the relationships between the concepts being investigated in order to understand the phenomenon.

The present study meets the four criteria that classify a research project as positivist (Myers & Avison 2002). First, positivist research proceeds from formal propositions (Myers & Avison 2002). Positivism heavily focuses on the hypothetic-deductive approach to theory testing (Chen & Hirschheim 2004; Myers & Avison 2002). Also referred to as research hypotheses, positivist research is conducted following an extensive review of the literature and a search for theory that may help in understanding the interrelationship between the concepts associated with the phenomenon being studied. The present study proceeded from a formulation of several hypotheses. The hypotheses were developed after conducting an extensive review of the literature.

Second, a research project may be considered positivist if the variables are measured quantitatively (Chen & Hirschheim 2004; Myers & Avison 2002). A key assumption of positivism is that everything is measurable (Ozanne & Hudson 1989). Therefore, in the present study, all variables are measured quantitatively. The measurement tools used in the present study, as will be demonstrated in subsequent sections, are valid and reliable.

Third, positivist research involves hypothesis testing (Chen & Hirschheim 2004). Through hypothesis testing, positivist researchers can obtain an objective truth. Rooted in the natural sciences, positivism holds that people and institutions, including their actions, can be studied objectively (Fisher 2007). Using quantitative data collected on each of the variables forming the hypotheses, statistical techniques are used to test the hypotheses.

Fourth, a research study is considered positivist if the findings of the study can be generalized to the general population from which the study sample is obtained (Chen & Hirschheim 2004; Myers & Avison 2002). Positivists strictly follow a recognized scientific protocol to obtain accurate and reliable findings that can be generalized to the target population (Myers & Avison 2002).

However, some have challenged the appropriateness of positivism in organisational research (Remenyi & Williams 1996). Those who reject positivism argue that reality is constructed and cannot be explained or understood by directly referring to universal laws. Critics of positivism are interested in meanings and interpretations, and rely on

qualitative techniques to study phenomena (Remenyi & Williams 1996). In addition, some of the variables considered unmeasurable in the past might have gone unresearched, suggesting that there could be deficiencies in the current knowledge on certain phenomena (Remenyi & Williams 1996). Moreover, those opposed to positivism argue that some of the problems observed in IS research, such as inconsistencies in research findings, have been attributed to the inappropriateness of positivism.

An alternative research paradigm is interpretivism (Chen & Hirschheim 2004). Interpretivism posits that reality can be fully understood through a subjective interpretation and intervention in that reality (Chen & Hirschheim 2004). Interpretivist philosophy is suited to research projects employing qualitative methodologies (Avison & Pries-Heje 2005). Since this paradigm advocates subjective interpretation, it is considered to be unsuitable for the purposes of the present research.

4.2   Research Design

Research design refers to the context in which different research activities or research components are integrated to ensure that the research is conducted in a way that addresses the research problem meaningfully and effectively (Cooper & Schindler 2011). Researchers should choose research designs that enable them to obtain appropriate and unambiguous data for their particular research problems (Vogt 2010). The data should be suitable for the specific research questions or hypotheses that the researchers intend to answer or test. Therefore, a good research design is crucial as it ensures that the research aims are achieved conclusively. The research design integrates different components of the research project such as sampling, data collection, and data analysis in a way that ensures that the study flows coherently and logically (Vogt 2010). The research problem determines the kind of research design that should be chosen.

The present study is conducted as quantitative research. Since the purpose of the research is to assess relationships between different concepts related to knowledge management, organisational resilience, and organisational performance, with a view of generalizing the findings to the target population, quantitative methods are more appropriate (Trochim & Donnelly 2001) than qualitative methodologies. The research design judged to be the most appropriate for this purpose is the survey research design (De Vaus 2001). The researcher intends to obtain data on the views of banking employees on issues related to

knowledge creation, organisational resilience, and organisational performance at one point in time, making the survey design the most suitable. The survey research design is also the most suitable because it allows the researcher to study many variables at one time. Creswell (2013) argued that a "survey design provides a quantitative or a numeric description of trends, attitudes, or opinions of a population by studying a sample of the population."

The survey method is more effective for showing correlations between research constructs and for generalizing from a sample to a target population (De Vaus 2001). This study examines the relationship between independent variables, such as knowledge creation and dependent variables such as organisational resilience and performance. This research design is also consistent with the approach adopted in prior IS studies, on which this research builds, as presented in Chapter 3. Figure 4.1 shows how different components of this research are integrated and investigated.

Inputs	Research Activities	Outputs
Literature review	Compilation of knowledge	Knowledge gaps and research questions
Theoretical Background	Conceptual Model	Hypotheses Development
Validated items and academic experts	Questionnaire development	Survey questionnaire
Unit of Analysis (Banks in Saudi)	Data collection	Data sets from the survey
	Descriptive data analysis	Descriptive results
Clean Data set	Statistical testing (SEM approach)	Statistical results
	Results	Findings
	Discussion and conclusion	Practical and theoretical implications

Quantitative data analysis

Figure 4.1: Research Activities

As shown in Figure 4.1, the first stage in the present study is to carry out an extensive review of the literature in the areas of organisational resilience, organisational performance and knowledge management. As an ongoing process, the review of the previous literature continued concurrently with the other research activities until the project was complete. The focus of the literature review became increasingly specific as the research process progressed. The more focused literature review was concerned with the identification and statement of the research problem and the formulation of the research questions and hypotheses. It also involved defining the scope of the research as being limited to the investigation of the influence of knowledge management on organisational resilience and organisational performance.

Following the identification of the gap in the previous research, and statement of the research aims and objectives, a research model and hypotheses were developed. The research constructs were identified, and the relationships among the constructs were investigated to help in the formulation of the research hypotheses. After developing a research model, a data collection tool was developed specifically to collect quantitative data from organisations in Saudi Arabia. Following the survey design, ethics approval was sought and granted by the University Ethics Committee. The next stage involved the collection of data from the sample.

Next, the collected quantitative data were exposed to statistical analysis not only to validate the model but also to test the research hypotheses. Finally, the results for each hypothesis testing were interpreted in light of the previous knowledge management, organisational resilience, and organisational performance literature to understand their implications for research and practice. These implications are provided. The following sections explain the survey and analysis method in detail.

4.3 Research Instrumentation/Construct Operationalization

Construct operationalization involves defining a research concept in measurable terms by clarifying how the concept will be quantitatively assessed (Hair et al. 2013). The operationalization of concepts is important because it establishes an accurate definition that guides the interpretations of the results. There are three main concepts in the present study: knowledge creation, organisational resilience, and organisational performance. These concepts are indirectly measured through several other concepts which are believed to be expressions of these three concepts, based on the literature review.

The knowledge creation process was assessed through four constructs, namely socialization, externalization, combination, and internalization. Organisational resilience was assessed through adaptation, innovation, agility, and robustness. The third factor, organisational performance, was assessed through the four BSC perspectives: financial, internal business process, customer related, and learning and growth perspective.

Each of the concepts under knowledge creation, organisational resilience, and organisational performance was operationalised as perceptions. The concepts were assessed using multiple items which were adapted from previous research (see Appendix A). Participants were asked to indicate on a five-point Likert-style scale the extent to which they agreed or disagreed with each of the statements to measure the concepts. The Likert-type scale ranged from 1 (strongly disagree) to 5 (strongly agree). The items, which were obtained from previous research and later adapted for the purposes of this research, are given in Table 4.1.

Table 4.1: Adopted measures.

Factors	Sub-factors	Measures derived from
Knowledge Creation Process	Socialisation	(Hoon Song, Uhm & Won Yoon 2011)
	Externalisation	
	Combination	
	Internalisation	
	Adaptability	Mafabi, Munene & Ntayi (2012)

	Innovative	(Oh & Teo 2006)
Organization Resilience	Agility	
	Robustness	(Kantur & Say 2015)
Organization Performance	Financial	(Blackmon 2008)
	Internal Business Process	
	Customer Related	
	Learning and Growth	

In order to guarantee reliability and validity, researchers are encouraged to employ previously validated tools whose reliability has already been ascertained, rather than developing their own survey tools (Bélanger and Crossler, 2011). Consequently, previously validated tools were used. However, the tools were revised and adapted to fit the context of the present study. These adaptations were necessary to guarantee content validity and to ensure that the measures were adequate and representative.

The researcher consulted experts from the Faculty of Engineering and Information Technology at the University of Technology Sydney, and the Faculty of Business, Government & Law, University of Canberra. They were asked to review the survey tool to determine whether the tool sufficiently measured each concept. The experts made recommendations that centered on wording and the redundancy of certain items. Appropriate amendments were made in line with the recommendations.

4.4 Instrument Translation

The survey was originally developed in English. A native English academic with extensive experience in survey development reviewed the questionnaire for wording and grammar. However, the survey tool needed to be translated into Arabic so that it could be administered in Saudi Arabian organizations. The translation was conducted using the forward translation procedure with a subjective evaluation to ensure that the resultant Arabic items performed as reliably as their English counterparts. The resultant Arabic version of the instrument was piloted using 10 participants that were native Arabic speakers.

The translation was intended to provide Arabian items that are functionally equivalent to the original English items, rather than rendering the questionnaire items from English to Arabic without conveying the functional sense of the original questionnaire items. This ensured that the Arabic items would deliver the same meaning as their English counterparts while having an acceptable level of readability. The translation process is detailed in the subsequent sections.

Forward Translation and Subjective Evaluation

The researcher engaged the services of two certified English-Arabic translators to translate the original survey tool from English into Arabic. Items in the Arabic version were compared item for item with their English counterparts with a view to ensure that the items' meanings remained as close to the meaning of the English items as possible. The comparison was also intended to ensure that the translation was done accurately. The researcher further assessed the final Arabic version to ensure that the Arabic items conveyed the same meanings as the items in the English version. In cases where inconsistencies in meaning were noted, the items were referred back to the two translators. The translators jointly worked on the translations to the satisfaction of the researcher.

4.5   Population and Sample

The target population for the present study was employees in the Saudi Arabian banking sector. Therefore, the study sample was a subset of the banking employees, which was obtained from selected banks in Saudi Arabia. The study sample reflects the attributes of the target population and is one of the significant qualities of quantitative research. The findings and conclusions drawn from the sample relate to the whole population. Research findings from studies that use highly representative samples are highly generalizable to the target population (Sarantakos, 1998). Such studies are considered as high quality studies (Sarantakos, 1998).

The cities of Jeddah, Taif, and Madinah in Saudi Arabia were chosen to conduct this research for two reasons. First, the researcher is familiar with these cities and understands its people, business's and culture. Secondly, the researcher worked in Jeddah as a software developer and currently works as a lecturer at the Technical College of Madinah.

It is essential to determine the appropriate sample size for a research project in order to obtain accurate results (Wolverton 2009). Previous research on structural equation modeling (SEM) identified certain parameters that may be used to determine appropriate sample sizes. For instance, Hair et al. (2013) identified five factors that may influence the results of SEM, namely multivariate data distribution; the technique used for estimation; the complexity of the model; the amount of missing data; and the amount of average error variance (Hair et al. 2013). A general rule of thumb across the SEM literature suggests that a sample size between 400 and 2000 is appropriate for 10 to 15 indicators. The present study uses a sample of more than 310 participants.

4.6   Data Collection

As it has been indicated in the previous section, the present study used a survey method of data collection. Babbie (2015) stated that "surveys are particularly useful in describing the characteristics of a large population because they make large samples feasible." The survey tool used for the present study consisted of closed-ended (Edwards 1997). In closed-ended survey questions, research participants were asked to choose from a fixed set of response alternatives (Edwards 1997) According to Hair et al. (2013), closed-ended questions tend to be common in quantitative studies that employ large-scale surveys. With the present study being quantitative and having more than 310 participants, closed-ended questions were appropriate for collecting the data. As a way of enhancing response rate, the design of the survey tool ensured that it took no more than 15 minutes to complete.

The researcher used both web-based and paper and pencil questionnaires to collect the data. Initially, a web-based questionnaire was used through an online survey tool called Qualtrics. Unfortunately, a low response rate was observed. Therefore, a paper-based survey was used. The researcher recruited participants from the selected banks with the help of human resource department personnel in each bank. Bank employees who

volunteered for the study were asked to return the completed questionnaires by dropping them at designated point at the human resource department. The researcher made follow-up calls fortnightly. The data collection was conducted from December 2016 to March 2017. A total of 500 participants were contacted. Of these, 350 returned their questionnaires (70% response rate), including the online questionnaires. Forty questionnaires were incomplete, and were excluded from the sample. The final sample consisted of 310 participants.

4.7   Quantitative Data Analysis Approach

After the data collection, data analysis was performed using specific statistical techniques (which are discussed in sections below). The statistical data analysis was conducted for three purposes. First, factor analysis and reliability tests were conducted to assess the validity and reliability of the measures. Second, descriptive statistics were conducted to gain insights into the data, particularly through measures of central tendency. Third, inferential statistical techniques were run to test the research hypotheses (Sekaran & Bougie 2016). Data analysis was performed using IBM SPSS Statistics version 24 and IBM SPSS AMOS 24 (SPSS 2012).

4.8   Measurement Scale Analysis

The measurement scale analysis was performed to assess the reliability and validity of all items. Anderson & Gerbing (1988) observed that examining a measurement model involves firstly conducting a two-step SEM approach. This operation is essential because it allows the research to establish the quality of the research model before evaluating the quality of the structural model. The measurement model for the present research was related to performing a confirmatory factor analysis (CFA) and model fit. This is necessary to ascertain whether the indicator variables substantially load onto the underlying factors (Kline 2011). CFA established whether widely accepted criteria for acceptable discriminant validity, convergent validity and reliability of latent variables were met.

Cronbach's alpha was used to measure item reliability. The results indicated that all the items were of acceptable internal reliability. Factor analysis was performed to assess the scale validity of the measures. This was accomplished using two techniques: exploratory factor analysis (EFA) and CFA. EFA is normally used to determine the underlying factor

structure of a group of observed variables. In other words, EFA helps researchers understand what the factor structure looks like depending on the responses provided by participants. CFA is a statistical technique employed for the purpose of verifying the factor structure of the observed variables. Researchers use CFA to determine whether there is a meaningful relationship between the observed variables and their underlying constructs. These two powerful factor analysis techniques provided a strong foundation for model testing.

In order to determine the reliability and validity of the measurement models, the researcher evaluated internal consistency, convergent validity and discriminant validity. Firstly, convergent validity was assessed using item loadings. To determine whether convergent validity was achieved, item loadings were expected to exceed 0.7 (Chin 1998). Secondly, the internal consistency of latent factors was assessed using Cronbach's alpha where a value of 0.7 was considered an acceptable threshold and the average variance extracted (AVE) was above 0.5. An AVE greater than 0.5 suggests that the extracted variables can explain more than 50 per cent of the variance in the measurement items (Hair et al. 2013). Finally, the square root of the AVE by a variable from its indicators was used to evaluate the convergent and discriminant forms of validity. This was not less than 0.70 and was larger than the correlation between the construct and other constructs. Moreover, item loading was not less than 0.70, with the loadings being higher on their assigned constructs than on other constructs (Fornell & Larcke 1981).

CFA is a well-known technique for testing whether a preconceived factor structure is consistent with the actual data (Hair et al. 2013). After CFA, statistical techniques, such as correlation analysis, were used to test the hypotheses. The statistical techniques were used to determine the extent to which specific items were associated with their scale so as to understand how influential the different factors were. Additionally, item-total correlations were considered to determine the extent to which a given item was part of its scale. A detailed description and the results of the measurement scale analysis are provided in the data analysis in Chapter 5.

4.8.1 Descriptive Data Analysis

Descriptive analysis was conducted for the participants' demographics. Descriptive analysis was also performed to assess the suitability of the data for multivariate analysis. This included the assessment of normality and screening for significant outliers. In addition, descriptive statistics were conducted for measures of central tendency and measures of dispersion. The normality assessment is measured by 'skewness' and 'kurtosis' techniques. Skewness is a tool for assessing the symmetry of the distribution while kurtosis is a measure of the peakedness (Hair et al. 2013). Regarding an outlier screening, which refers to the observation values in a given sample that are markedly different from the rest of the observations, all observations were transformed into standardised z-scores to calculate an absolute value of z-scores ($|z|$). Scores that were greater than 3.29 were classified as outliers (Tabachnick & Fidell 2008). The results of this stage are presented in the data analysis in Chapter 5.

4.8.2 Structural Equation Modeling (SEM)

Previous research shows that SEM is commonly used in empirical research studies. To perform SEM analysis, a number of software packages, such as, LISREL, AMOS, SmartPLS and PLS-Graph are used. The development of SEM software is guided by two different statistical algorithms (Avison & Pries-Heje 2005). The first is covariance, which inspired the development of LISERL and AMOS. The second algorithm that forms the basis for the development of SEM is the partial least squares (PLS), which was used in the development of PLS-Graph and SmartPLS.

The techniques used in SEM differ in several ways because each model is based on dissimilar statistical algorithms (Gefen & Straub 2005). Unlike the PLS approach, covariance-based SEM can generate a set of fit indices to provide the model fit. Furthermore, covariance-based SEM is a powerful tool for comparing a hypothesized model to the best possible fitting model. Therefore, the covariance-based SEM technique is more suitable for confirmatory research intended to test hypotheses. In line with the above guidelines, covariance-based SEM was selected as the SEM technique for hypothesis testing in the present study.

After measuring the reliability and validity of the data, the conceptual model was assessed using SEM. IBM SPSS-Amos program (version 24) was used to perform the SEM analysis. The SEM methods are used to assess structural relationships between observed variables and theoretical constructs. As discussed above, the measurement scale analysis using EFA and CFA was conducted first to model the correlations between various observed and latent factors (Hair et al., 2013). The SEM technique was used to facilitate the transformation from exploratory to confirmatory analysis (Hair et al., 2013) by clarifying the benefits of the approach.

The SEM analysis is a powerful technique for the analysis of data with inferential aims (Byrne 2013). In addition, SEM analysis can significantly estimate dependence correlations any given time (Hair, Ringle & Sarstedt 2011). SEM analysis is also a favourite for the integration of observed variables and theoretical constructs (Byrne 2013; Kline 2011).

In the current study, a two-tailed significance level was set at 0.05. The percentage of the variance in the dependent variable accounted for by the independent constructs in the model was determined using the R^2 value. The R^2 values were interpreted according to Hair et al. (2011): 0.75 (substantial); 0.50 (moderate); and 0.25 (weak).

The mediating effect of organizational resilience on the relationship between the knowledge creation process and organizational performance was assessed using structural equation modelling (SEM). Baron and Kenny (1986, p. 1176) observed that "mediators speak to how or why" an independent variable a dependent variable occurs. This is an indication that mediation variables explain the relationship between the independent variables and the dependent variable. As a mediator variable, organizational resilience explains the effect of the knowledge creation process on organizational performance in the Saudi banking industry. Because organizational resilience accounts for the relationship between the knowledge creation process and organizational performance, it was considered as a mediator variable. This suggests that variations in organizational resilience account for the variations in organizational performance.

In the context of the organizational performance, it is of great interest to identify and understand the mechanism by which factors that enhance organizational performance such as knowledge creation achieve their effect. Therefore, mediation analysis with structural equation modelling was conducted to gain insight and acquire deep

understanding regarding how and why knowledge creation process enhances organizational performance in the banking sector. The mediation analysis in this study was done to gain insight and acquire deep understanding about the mechanism through which the knowledge creation process positively influences organizational performance in the banking industry.

Mediation analysis, but not moderator analysis, was suitable for this study. The reason is that, according to Baron and Kenny (1986, p. 1176), moderator variables specify when certain effects will hold." This is an indication that a moderator variable modifies the strength and direction of the relationship between the independent variable and the dependent variable. Moderator variables affect the direction and/or strength of the association between a predictor variable and outcome variable (Baron and Kenny, 1986). Moderator variables do not account for the existence of the relationship between the independent variable and the dependent variable. Since the aim was to explain the effect of the knowledge creation process on organizational performance, mediation analysis was the suitable technique.

Mediation analysis was the most suitable multivariate technique for mediation analysis. Mediation analysis is based on the assumption of causality and temporal ordering among the three variables under this study: knowledge creation process which was the exogenous variable; organizational resilience which was the mediator variable; and organizational performance, which was the endogenous variable (MacKinnon et al., 2007). Given that variables involved in a causal relationship can act as both causes and effects, a standard regression model was not suitable for this modelling because regression analysis requires a prior assignment of variables either a cause or effect. In other words, regression analysis was not suitable because it clearly distinguishes between predictor and response variables.

Structural equation modelling provided a more appropriate framework for mediation analysis in the present study. It was considered as more appropriate because when a model contains latent variables, structural equation modelling makes the interpretation and estimation easy (MacKinnon et al., 2008). Structural equation modelling is partially designed to test complicated mediation models in a single analysis, which results in a simplified way of testing mediation hypotheses (McKinnon et al., 2008). Further, structural equation modelling provides model fit information regarding the consistency

of the expected mediational model to the data, and evidence showing whether causality assumptions are plausible (Bollen and Pearl, 2012; Imai et al., 2010).

4.9   Ethics Consideration

The present study was conducted in line with the ethical requirements for research involving humans as participants. The researcher was keen to ensure that key relevant ethical concerns related to informed consent, privacy of participants, anonymity and confidentiality. To ensure that participants gave their informed consent, the researcher provided sufficient information regarding the purpose of the present study, and the time needed to complete the questionnaire. In addition, participants were assured that that they were entirely free to refuse to participate in the study, or to withdraw from the study at any time without any consequences from the human resource department whatsoever. The researcher understood the obligation to ensure the particpants' privacy and confidentiality were protected. In addition to informing the participants that the information they provided would remain confidential, all reasonable precautions were taken to ensure the information remained anonymous. The research received ethical approval from the Human Research Ethics Committee (HREC) – University of Technology Sydney [Ethics approval: UTS HREC 2015000696] before the data collection. The committee considered this study as presenting negligible/nil risk to the participants.

4.10   Chapter Summary

This chapter presented a discussion of the research methods adopted in the present study. The study was conducted as quantitative research using a survey design. The research was grounded in the philosophical underpinnings of positivism, which considers reality as stable, observable, and describable from an objective point of view. Data for the study were collected using a questionnaire with closed-ended questions assessed on a five-point Likert scales. Data were collected from sample of 310 bank employees in Saudi Arabia. Structural equation modeling was used for hypotheses testing. The research project adhered to the standard ethical requirements for research involving human participants.

CHAPTER 5 : RESULTS

The findings of the study are provided in this chapter. The first section overviews the participants' demographic details. The second section provides the descriptive statistics for the study's variables. This is followed by the results of the exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), which are assessments of the measurement model's validity. Finally, the results of the structural model are provided, which are organized according to the study's hypotheses.

5.1 Questionnaire Survey and Participants Profiles

As discussed in the previous chapter, the data for the present study were collected using a survey tool. The 12-item tool was designed to collect data that were used to examine the relationship between the knowledge creation process, organisational resilience, and organisational performance. These concepts were assessed using five-point Likert-type scales.

5.1.1 Questionnaire Survey

The survey was administered among bank employees in Saudi Arabia. The data were collected between December 2016 and March 2017. The banks are in the cities of Jeddah, Medina, and Taif.A total of 500 questionnaires were distributed. The response rate was 70%. Surveys that were not filled in completely were excluded, leaving a total of 310 questionnaires, which were used for the purposes of this study.

5.1.2 Participants Profiles

This section provides the participants' demographics in relation to their gender, age, education, work experience, job function, and nationality. The details of each category are presented below. Participants' details are shown in Table 5.1.

Table 5.1. Participant Profile

Characteristics	Categories	Frequency	Percentage
Gender	Male	225	73
	Female	85	27
Age	18-25	40	13
	26-35	140	45
	36-45	80	26
	45+	50	16
Education	High School	25	8
	Diploma	100	32
	Bachelor's degree	140	45
	Postgraduate degree	45	15
Work experience	Less than one year	10	3
	1 – 3 years	25	8
	3 – 5 years	120	39
	More than 5 years	155	50
Job function	Retail Banking	40	13
	Corporate & Investment Banking	25	8
	Islamic Banking	35	11
	Risk Management	15	5
	Financial Control	26	8
	Global Operations [Compliance/Management]	21	7
	Human Resource	59	19
	Information Technology & System	41	13
	Learning & Development	11	4
	Marketing & Brand Management	23	7
	Legal & Corporate Affairs	14	5
Participant nationality	Saudi	230	74
	Non Saudi	80	26

Gender

The majority of the participants (225) were male (73%), as shown in Table 5.1. The gender distribution in this study is a fair reflection of the gender distribution in the selected Saudi banks. Figure 5.1 shows the distribution of gender for the study participants.
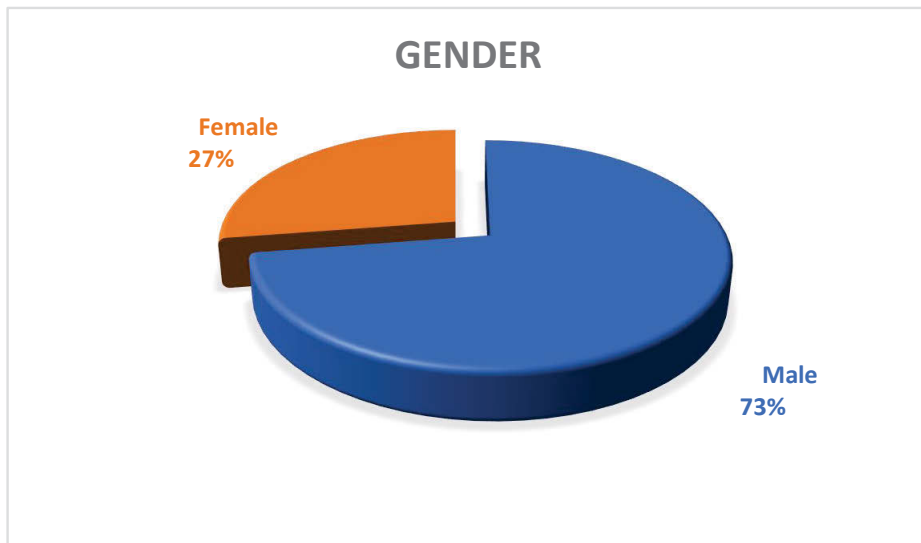
Figure 5.1. Participants' Gender

Age

As shown in Table 5.1 and Figure 5.2 , the majority of the participants were aged between 26-45 years old. 45% of the participants were in the 26-35 age group. As shown in Table 5.1, only 16% of the participants indicated that they were more than 45 years old.
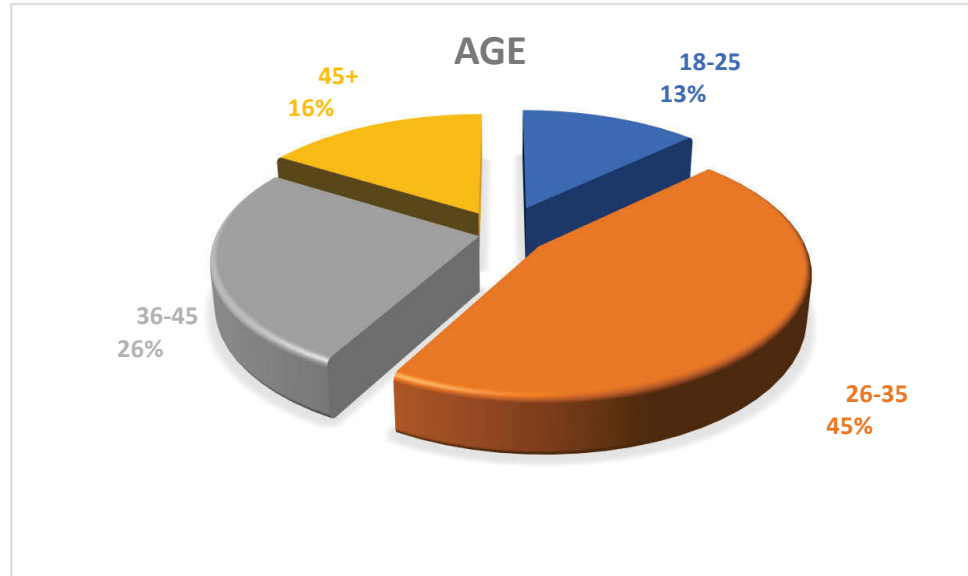
Figure 5.2. Participants' age

Education

Regarding the participants' educational background, the data in Table 5.1 and Figure 5.3. suggest the most common level of education was a Bachelor's degree with 45% of the participants having attained this qualification. A small percentage of the participants (8%) had a high school qualifications only. Similarly, a small percentage of the participants (15%) had earned postgraduate qualifications.
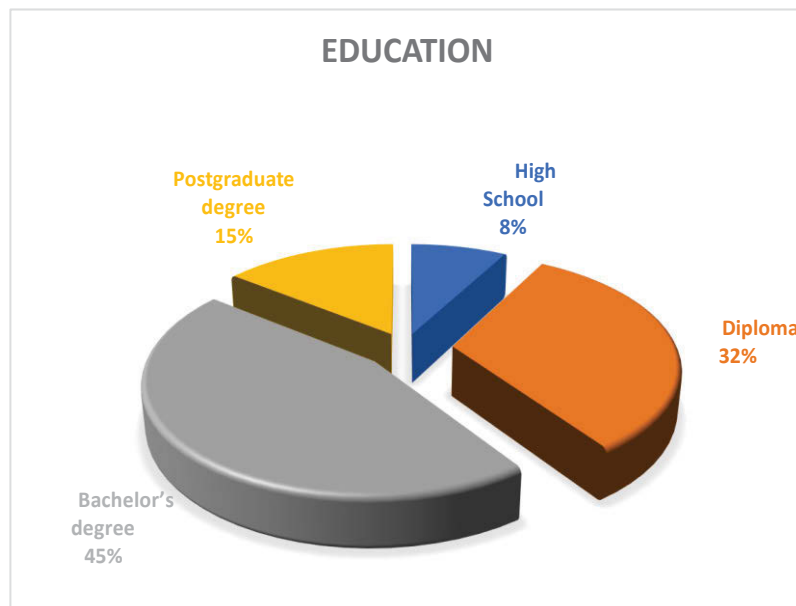
Figure 5.3. Participants' Education levels

Work Experience

The information provided in Table 5.1 and Figure 5.4 shows that half of the participants (50%) had worked in a bank for more than 5 years. A high number of participants (39%) indicated that they had 3-5 years of experience in the banking sector. There were only 10 participants (3%) who said that their experience was less than five years.
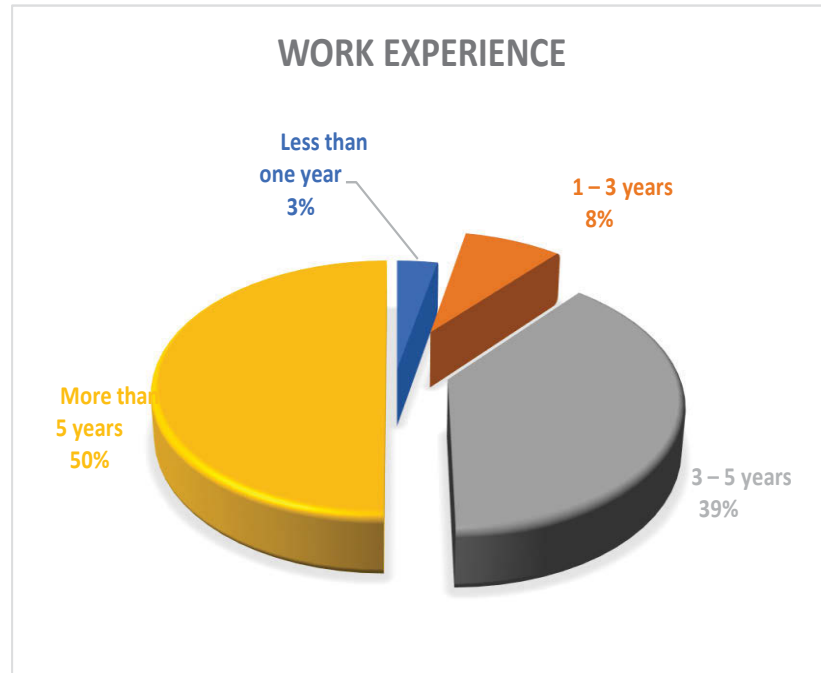
Figure 5.4. Participants' Work Experience

Job function

There were 11 functions investigated in this study as shown in Table 5.1 and Figure5.5. The most common function was human resource, which was identified by 59 participants. A total of 40 participants indicated that they worked in the retail department, while 35 employees were attached to the Islamic banking section. The information technology & systems function was also common, with a total of 41 employees. However, the learning and legal & corporate affairs departments were not common, being only identified by 11 and 14 participants, respectively.
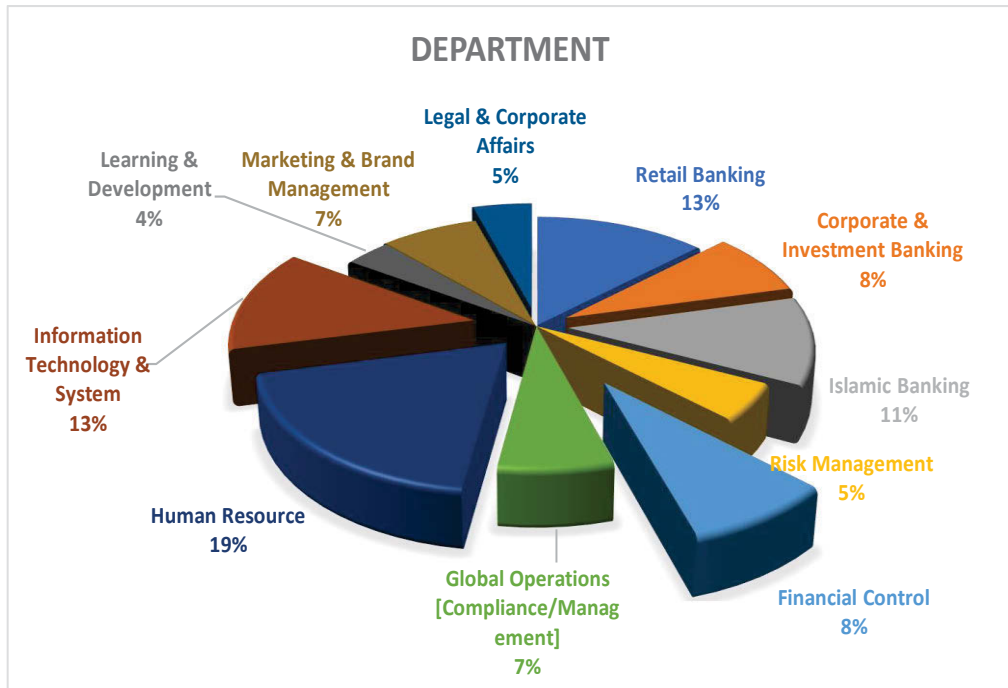
Figure 5.5. Participants' bank function

Participant Nationality

Participants were asked to indicate whether they were a Saudi or a non-Saudi. The majority of the participants (74%) identified their nationality as Saudi, as shown in Table 5.1. The distribution of the nationalities is shown in Figure 5.6.
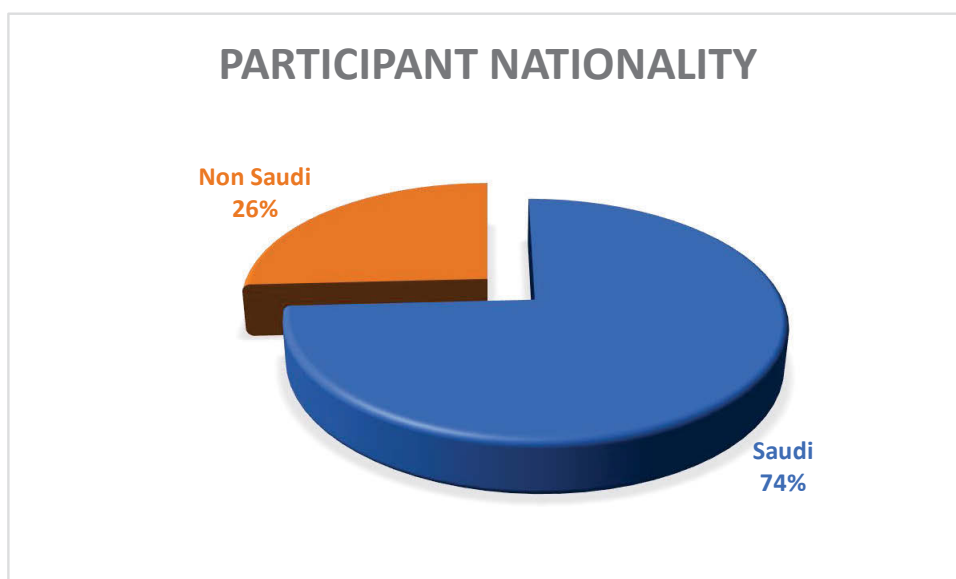
Figure 5.6. Participants' Nationality

5.2   Verifying Data Characteristics

This section provides the results of the data screening. The section contains the results of the assessment of normality, identification of the outliers, and dealing with the missing. In addition, this section provides the mean and standard deviations of the data set.

5.2.1   Missing Data Analysis and Assessment of Normality

Prior to the data analysis, the data were tested for missing responses. This process led to the removal of ten incomplete responses. As such, there were no instances of missing data in this study. Furthermore, the data were assessed for normality, which is one of the most important steps in data analysis (Hair et al., 2006). The normality assumption may be assessed using two common approaches, namely, 'skewness' and 'kurtosis' (Tabachnick & Fidell 2007). Kutosis is used in assessing the peakedness of the distribution while skewness assesses the extent to which the distribution is symmetrical (Hair et al., 2006). A distribution is considered normal if the Kurtosis and skewness values range between +2.00 and -2.00 for a normal distribution. Table 5.2, Table 5.3, and Table 5.4 provide the kurtosis and skewness values for knowledge creation, organisational resilience, and organisational performance.

5.2.2   Standard Deviation and the Mean

Standard deviation (SD) is used to quantify the extent to which the cases of a data set differ from the mean value (Field 2013). A small SD value shows less dispersion of data, and is an indication of effective data representation. However, a large SD value indicates poor representation of the data. In addition, the standard error of the sample mean was also assessed. The standard error of the sample mean is considered as an assessment of how far the sample mean is likely to be from the population mean. In the current study, the SD value for all the factors suggests that there was an effective representation of the data (see Table 5.2, Table 5.3, and Table 5.4). Consequently, the mean can be used as a representative score for each of the factors in the data set.

5.2.3   Outliers Screening

According to Field (2013), it is essential to screen the data for the presence of outliers, and to deal with them appropriately to address any bias that might compromise the mean. In a given data set, an outlier refers to the observations that are markedly dissimilar from the rest of the observations in the data set (Hair et al., 2006). For instance, a value of more than three standard deviations beyond the mean for a given case is considered as an outlier (Kline 2015). For this reason, all 310 cases in the current study were converted into standardised z-scores to detect extreme deviations. Any case with an absolute z-score value ($|z|$) exceeding 3.29 was deemed to be an outlier (Tabachnick & Fidell 2007). In the present study, all the factors were found to have absolute z-scores lower than 3.29, suggesting that there were no outliers in the data set (refer Table 5.2, Table 5.3, and Table 5.4 for details).

5.3   Preliminary Data Analysis

This section provides the results of the descriptive analyses described in the previous sections. The results are organized according to the three major concepts investigated in this study, the knowledge creation process, organisational resilience and organisational performance.

5.3.1   Knowledge Creation Process Factors

The knowledge creation process factors were: socialisation (SL), externalisation (EX), combination (Comb) and internalisation (INT). Each of the factors was assessed using five Likert-type items. Table 5.2. contains the results of the data screening for the knowledge creation process. The findings suggest that there were no outliers in the data set because there were no cases of z-scores greater than 3.29, and that both kurtosis and skewness values were within the recommended range of between +2.00 and -2.00 for normal distribution. These observations provide sufficient evidence to conclude that the data were normally distributed.

Table 5.2. Descriptive statistics of the knowledge creation process factors

Knowledge Creation Process Factors	Cases with z > 3.29	Skewness	Kurtosis	Mean	StdErr
Socialisation (SL)					
SL1: During discussion, I try to find out others' opinions, concepts, thoughts or ideas	0.0%	-0.73	0.17	4.2	0.02
SL2: During discussion, I often encourage others to express their concepts, thoughts or ideas	0.0%	-0.71	0.33	4.1	0.02
SL3: My colleagues and I will actively share life or work experience with each other	0.0%	-0.78	0.19	4.2	0.02
SL4: I gather information from other departments	0.0%	-0.65	0.16	4.3	0.03
SL5: Before discussion, I will collect necessary information and show it to my colleagues.	0.0%	-0.68	0.17	4.1	0.02
Externalisation (EX)					
EX1: When others can't understand me, I am usually able to give him/her examples to help the explanation	0.0%	-0.49	0.32	3.8	0.03
EX2: Most of the time, I can transcribe some of the unorganized thoughts into concrete ideas	0.0%	-0.32	0.34	4.1	0.03
EX3: I tend to describe professional or technical terms with conversational language to help communication.	0.0%	-0.26	0.42	3.7	0.03
EX4: I tend to use analogies when expressing abstract or (theoretical) concepts.	0.0%	-0.39	0.33	4.2	0.02
EX5: Our team develops new ideas through	0.0%	-0.42	0.35	4.1	0.02

constructive dialogue by using figures and diagrams.					
Combination (Comb)					
Comb1: During the discussion, I tend to help organise ideas and draw conclusion to facilitate the discussion	0.0%	-1.07	0.22	4.2	0.02
Comb2: When coming across problems, I tend to use my experience to help solving problems	0.0%	-0.53	0.26	4.1	0.02
Comb3: After every event, I have the habit of organising and summarising what happened	0.0%	-0.71	0.33	4.1	0.02
Comb4: During discussion, I will organize everyone's thoughts in my mind	0.0%	-0.78	0.19	4.2	0.02
Comb5: I like to collect new information, and make a connection between new and old knowledge to develop new concepts.	0.0%	-0.65	0.16	4.3	0.03
Internalization (INT)					
INT1: After hearing a new idea or concept, I tend to compare it with my experience to help me comprehend the meaning.	0.0%	-0.16	0.42	3.5	0.04
INT2: I understand others' thoughts better by repeating what they say and asking them "Is this what you mean?"	0.0%	-0.17	0.32	3.4	0.03
INT3: I will tell others what I think to make sure my understanding is the same as theirs.	0.0%	-0.14	0.43	3.3	0.02
INT4: When I have finished saying something, I will ask the other person if it is	0.0%	-0.32	0.41	3.3	0.02

necessary for me to repeat it to make sure he/she understands exactly what I mean.					
INT5: When communicating with others, I will give others time to think about what we just discussed.	0.0%	-0.44	0.53	3.3	0.02

5.3.2 Organisational Resilience

Organisational resilience is considered to be four-dimensional concept. The four dimensions, also called factors in this study, are adaptation (Adp), innovative (Inv), agility (Agl), and robustness (Rbt). 12 items were used to measure organisational resilience, as shown in Table 5.3 The data in Table 5.33 show that there were no cases of z-scores whose values were larger 3.29 and that both kurtosis and skewness values were within the recommended value range of between +2.00 and -2.00 for normal distribution. This is convincing evidence that the data were normally distributed.

Table 5.3. Descriptive statistics of the organisational resilience factors

Organisational Resilience Factors	Cases with $z > 3.29$	Skewness	Kurtosis	Mean	StDev
Adaptation (Adp)					
Adp1: The services offered by the bank that I work for conform to the regulatory standards.	0.0%	-0.18	-0.16	3.7	0.02
Adp2: In the bank that I work for, we have made service delivery more flexible.	0.0%	-0.17	-0.15	3.4	0.02
Adp3: The service delivery in the bank that I work for is in line with our customers' needs.	0.0%	-0.12	-0.41	3.1	0.02
Adp4: In the bank that I work for, we have	0.0%	-0.18	-0.28	3.9	0.02

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maintained our bank's reputation.					
Innovative (Inv)					
Inv1: We provide unique products and services to our customers.	0.0%	-0.65	0.23	4.2	0.03
Inv2: We bundle products and services creatively.	0.0%	-0.40	0.37	4.2	0.03
Inv3: We offer new customer support services.	0.0%	-0.63	0.32	4.3	0.02
Agility (Agl)					
Agl1: We continually sense and detect customer and marketplace opportunities	0.0%	-0.30	0.34	4.1	0.03
Agl2: We respond quickly to dynamic business.	0.0%	-0.53	0.32	3.7	0.02
Agl3: We react rapidly to competitors' market actions.	0.0%	-0.43	0.26	4.2	0.02
Robustness (Rbt)					
Rbt1: The bank that I work for stands straight and preserves its position.	0.0%	-0.26	0.42	3.7	0.03
Rbt2: The bank that I work for is successful in generating diverse solutions.	0.0%	-0.39	0.33	4.2	0.02
Rbt3: The bank that I work for does not give up and continues its path.	0.0%	-0.42	0.35	4.1	0.02

5.3.3 Organization Performance

Four factors were used to measure organisational performance, namelythe financial perspective (FP), the internal business process perspective (IBPP), the customer related perspective (CRP), and the learning & growth perspective (LGP). The factors were measured using 15 Likert-type items. Table 5.4 provides information on the screening of the data relating to the organisational performance factors. The data in Table 5.4 show that there were no cases of z-scores with values greater than 3.29. In addition, both

kurtosis and skewness values were within the acceptable range of between +2.00 and -2.00 for normal distribution. These findings imply that the data were normally distributed.

Table 5.4. Descriptive statistics of the organisational performance factors

Organization Performance Factors	Cases with z > 3.29	Skewness	Kurtosis	Mean	StDev
Financial Perspective (FP)					
FP1: The bank that I work for has improved its asset utilization.	0.0%	-0.57	-0.12	3.7	0.03
FP2: The net income of the bank that I work for has increased.	0.0%	-0.33	-0.46	3.6	0.03
FP3: The sales of the bank that I work for have increased.	0.0%	-0.55	-0.19	3.9	0.03
FP4: The market value of the bank that I work for has increased.	0.0%	-0.46	-0.39	3.7	0.03
Internal Business Process Perspective (IBPP)					
IBPP1: The bank that I work for has improved its quality control processes.	0.0%	-0.33	0.24	3.7	0.03
IBPP2: The bank that I work for has improved its service/product delivery processes.	0.0%	-0.42	0.14	3.8	0.03
IBPP3: The bank that I work for has developed policies and procedures to increase customer satisfaction.	0.0%	-0.49	0.12	3.9	0.03
IBPP4: The bank that I work for consistently follows service/product quality protocols.	0.0%	-0.40	0.32	3.8	0.03
Customer Related Perspective (CRP)					

CRP1: The bank that I work for has improved the number of services/products that it provides.	0.0%	-0.30	0.34	4.1	0.03
CRP2: In the bank that I work for has an increased number of people who use its services/products.	0.0%	-0.53	0.32	3.7	0.02
CRP3: In the bank that I work for, the demand for its services/products has increased	0.0%	-0.43	0.26	4.2	0.02
CRP4: The bank that I work for introduces innovative and unique functional services/products more often than its competitors.	0.0%	-0.53	0.32	3.7	0.02
CRP5: The bank that I work for has a better R&D cycle time for services/products than its competitors (length of time from conception to introduction).	0.0%	-0.43	0.26	4.2	0.02
Learning & Growth Perspective (LGP)					
LGP1: I receive enough information to perform my job.	0.0%	-0.26	0.42	3.7	0.03
LGP2: I have enough information to make optimal decisions to accomplish my performance objectives.	0.0%	-0.39	0.33	4.2	0.02
LGP3: The bank that I work for provides the training that I need to meet my job requirements.	0.0%	-0.42	0.35	4.1	0.02
LGP4: The bank that I work for provides training that is linked to the bank's goals and objectives.	0.0%	-0.53	0.32	3.7	0.02

5.4   Measurement Scale Analysis

After data screening, measurement scales analysis was performed in order to assess the reliability and validity of the data collection tool using EFA and CFA. As noted in the previous chapter, the purpose of measurement scale analysis is to validate and test the factor structures of the model.

5.4.1   Reliability Assessment

The degree of correlation between items within an individual construct was assessed using reliability assessment (Straub et al. 2004). There are two common methods used in reliability assessment, internal consistency and item-total correlation (Cronbach 1971). Cronbach's alpha (α), which shows the extent to which responses across a measurement scale are in agreement, is assessed through internal consistency (Kline 2015). A Cronbach value below 0.60 is an indication of poor factor definition for a multidimensional construct, while a high Cronbach value (such as 0.95) may be an indication of common methods (Straub et al., 2004). The generally accepted Cronbach's alpha value is 0.70 (Hair et al., 2011). The item-total correlation is the composite score of all the constructs, and shows the correlation associated with the construct (Lu, Lai & Cheng 2007). When the corrected item-total correlation goes below 0.30, there is a possibility that the factor does not measure the same concept as the other factors (Pallant 2010). The data given in Table 5.5, Table 5.6, Table 5.7, and Table 5.8 show that the value of internal consistency exceeded the acceptable level of 0.70 for all constructs, while the item-total correlation scores were higher than the 0.40 values.

Table 5.5. Cronbach's alphas of measurement scales

Construct	#of Items	Cronbach's Alpha (α)	Result
Socialisation (SL)	05	0.84	Very Good
Externalisation (EX)	05	0.85	Very Good
Combination (Comb)	05	0.83	Very Good
Internalization (INT)	05	0.84	Very Good
Adaptation (Adp)	04	0.83	Very Good

Innovative (Inv)	03	0.82	Very Good
Agility (Agl)	03	0.81	Very Good
Robustness (Rbt)	03	0.80	Very Good
Financial Perspective (FP)	03	0.89	Excellent
Internal Business Process Perspective (IBPP)	04	0.86	Very Good
Customer Related Perspective (CRP)	05	0.79	Good
Learning & Growth Perspective (LGP)	04	0.77	Good

Table 5.6. Reliability assessment of the knowledge creation process factors

Knowledge Creation Process Factors	Cronbach's Alpha α	Item total correlation	Cronbach's α if Item Deleted
Socialisation (SL)			
SL1: During discussion, I try to find out others' opinions, concepts, thoughts or ideas	0.72	0.64	0.85
SL2: During discussion, I often encourage others to express their concepts, thoughts or ideas	0.73	0.53	0.83
SL3: My colleagues and I will actively share life or work experience with each other	0.73	0.55	0.81
SL4: I gather information from other departments	0.72	0.69	0.83
SL5: Before discussion, I will collect necessary information and show it to my colleagues.	0.72	0.63	0.81
Externalisation (EX)			
EX1: When others can't understand me, I am usually able to give him/her examples to help the explanation	0.73	0.59	0.80
EX2: Most of the time, I can transcribe some of the unorganized thoughts into concrete ideas	0.74	0.56	0.79
EX3: I tend to describe professional or technical terms with conversational language to help communication.	0.75	0.61	0.81
EX4: I tend to use analogies when expressing abstract or (theoretical) concepts.	0.83	0.72	0.85
EX5: Our team develops new ideas through constructive dialogue by using figures and diagrams.	0.83	0.67	0.84

Combination (Comb)			
Comb1: During the discussion, I tend to help organise ideas and draw conclusion to facilitate the discussion	0.72	0.59	0.82
Comb2: When coming across problems, I tend to use my experience to help solving problems	0.75	0.56	0.80
Comb3: After every event, I have the habit of organising and summarising what happened	0.73	0.60	0.85
Comb4: During discussion, I will organize everyone's thoughts in my mind	0.83	0.72	0.86
Comb5: I like to collect new information, and make a connection between new and old knowledge to develop new concepts.	0.82	0.69	0.89
Internalization (INT)			
INT1: After hearing a new idea or concept, I tend to compare it with my experience to help me comprehend the meaning.	0.80	0.62	0.86
INT2: I understand others' thoughts better by repeating what they say and asking them "Is this what you mean?"	0.79	0.62	0.82
INT3: I will tell others what I think to make sure my understanding is the same as theirs.	0.77	0.54	0.80
INT4: When I have finished saying something, I will ask the other person if it is necessary for me to repeat it to make sure he/she understands exactly what I mean.	0.72	0.63	0.80
INT5: When communicating with others, I will give others time to think about what we just discussed.	0.71	0.67	0.84

Table 5.7. Reliability assessment of organisational resilience factors

Organisational Resilience Factors	Cronbach's Alpha α	Item total correlation	**Cronbach's α** if Item Deleted
Adaptation (Adp)			
Adp1: The services offered by the bank that I work for conform to the regulatory standards.	0.81	0.69	0.86
Adp2: In the bank that I work for, we have made service delivery more flexible.	0.82	0.64	0.81
Adp3: The service delivery in the bank that I work for is in line with our customers' needs.	0.79	0.58	0.83
Adp4: In the bank that I work for, we have maintained our bank's reputation.	0.77	0.65	0.86
Innovative (Inv)			
Inv1: We provide unique products and services to our customers.	0.76	0.70	0.80
Inv2: We bundle products and services creatively.	0.79	0.66	0.82
Inv3: We offer new customer support services.	0.81	0.63	0.84
Agility (Agl)			
Agl1: We continually sense and detect customer and marketplace opportunities	0.81	0.73	0.86
Agl2: We respond quickly to dynamic business.	0.82	0.67	0.86
Agl3: We react rapidly to competitors' market actions.	0.83	0.69	0.87
Robustness (Rbt)			
Rbt1: The bank that I work for stands straight and preserves its position.	0.73	0.65	0.77

Rbt2: The bank that I work for is successful in generating diverse solutions.	0.76	0.66	0.81
Rbt3: The bank that I work for does not give up and continues its path.	0.77	0.70	0.80

Table 5.8. Reliability assessment of organisational performance factors

Organization Performance Factors	Cronbach's Alpha α	Item total correlation	Cronbach's α if Item Deleted
Financial Perspective (FP)			
FP1: The bank that I work for has improved its asset utilization.	0.83	0.67	0.84
FP2: The net income of the bank that I work for has increased.	0.86	0.66	0.88
FP3: The sales of the bank that I work for have increased.	0.89	0.69	0.85
FP4: The market value of the bank that I work for has increased.	0.87	0.67	0.85
Internal Business Process Perspective (IBPP)			
IBPP1: The bank that I work for has improved its quality control processes.	0.75	0.63	0.84
IBPP2: The bank that I work for has improved its service/product delivery processes.	0.77	0.64	0.81
IBPP3: The bank that I work for has developed policies and procedures to increase customer satisfaction.	0.81	0.72	0.84
IBPP4: The bank that I work for consistently follows service/product quality protocols.	0.81	0.77	0.86
Customer Related Perspective (CRP)			
CRP1: The bank that I work for has improved the number of services/products that it provides.	0.78	0.65	0.80
CRP2: In the bank that I work for has an increased number of people who use its services/products.	0.83	0.64	0.80
CRP3: In the bank that I work for, the demand for its services/products has increased	0.81	0.62	0.83

CRP4: The bank that I work for introduces innovative and unique functional services/products more often than its competitors.	0.82	0.71	0.87
CRP5: The bank that I work for has better R&D cycle time for services/products than our competitors (length of time from conception to introduction).	0.80	0.64	0.85
Learning & Growth Perspective (LGP)			
LGP1: I receive enough information to perform my job.	0.81	0.77	0.83
LGP2: I have enough information to make optimal decisions to accomplish my performance objectives.	0.83	0.71	0.84
LGP3: The bank that I work for provides the training that I need to meet my job requirements.	0.85	0.69	0.84
LGP4: The bank that I work for provides training that is linked to the bank's goals and objectives.	0.83	0.70	0.83

5.4.2 Exploratory Factor Analysis

The reliability assessment was followed by the EFA, which is considered an essential preliminary analysis of testing the research hypotheses (Gerbing and Anderson 1988). EFA is conducted using Bartlett's Test of Sphericity, and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Field 2013) to examine the inter-correlations of the entire correlation matrix (data factorability). The KMO and Bartlett's Test of Sphericity are used to determine whether the data meet the minimum standards for EFA. For KMO, the minimum acceptable level is 0.60 (Field 2013), while for Bartlett's Test of Sphericity, the significance level may be 0.05 or lower to indicate sufficient correlation between the items. As shown in Table 5.9, the KMO measure and Bartlett's Test for this study sample was acceptable, suggesting that the data met the minimum standards required for EFA to provide meaningful results.

Table 5.9. KMO and Bartlett's Test of Sphericity

Construct	KMO*	Bartlett's Test of Sphericity		
		Approx. Chi-Square	*df*	Sig.
Knowledge Creation Process factors	0.92	7331.5	77	0.000
Organisational Resilience factors	0.90	4797.7	33	0.000
Organization Performance factors	0.90	164.122	15	0.000
* Kaiser-Meyer-Olkin Measure of Sampling Adequacy				

After confirming that the data met the minimum requirements for EFA, factor extraction was performed using Principal Component Analysis (PCA). The eigenvalue criterion was used to guide the extraction of factors. The factors extracted were those with eigen values of more than 1 (Hair et al., 2006).

In addition, the percentage of variance criterion gives insights concerning the specific amount of variance that the extracted factors could explain (Hair et al., 2006). The information provided in Table 5.10 shows that the total cumulative variance of all the factors was acceptable.

Table 5.10. Total variance explained and reliability of the factors

Factors	Total Variance explained (%)	Cronbach's Alpha
Knowledge Creation Process factors	70.60	0.85
Organisational Resilience factors	66.52	0.90
Organization Performance factors	71.43	0.87

5.5 Measurement Model

The measurement model, which included CFA and the model fit, was performed after the EFA (Kline 2015). This step was important as it helped to determine how well the items loaded onto their corresponding unobserved factors (Kline 2015). CFA was used to evaluate the factor validity of all the measurement scales

5.5.1 Confirmatory Factor Analysis

CFA is an important technique in assessing factor validity and unidimensionality (Heir et al. 2006). As noted in the previous chapter, CFA is assessed by convergent and discriminant validity. Convergent validity is assessed through the average variance extracted (AVE) and composite reliability (CR). When the CR value exceeds the AVE (which by itself is more than 0.5), convergent validity is considered to have been attained (Hair et al., 2006).

Discriminant validity is used to assess whether a given factor differs meaningfully from the other factors. To conclude that discriminant validity has been achieved, the individual AVE square roots should be higher than any correlation between the unobserved variables. The loadings of individual indicators for each of the factors were more than 0.70, suggesting that the latent variable was reliable. The loadings were statistically significant at the < 0.05 significance level.

The CR coefficient, which is similar to the Cronbach's alpha coefficient, may be used to assess the measure's internal consistency. The CR should be at least 0.70 for internal consistency to be considered as having been achieved (Gefen et al., 2000). In the present study, the CR was higher than the corresponding AVE and the entire AVE met the minimum standards for the presence of convergent validity, which is 0.5. The AVE square root of the individual factors was larger than the correlations with all the other factors. The next section provides the results of the reliability and validity assessment for all the factors. The results suggest that all the factors met the threshold for reliability and validity.

5.5.1.1 Knowledge Creation Process Factors

The knowledge creation process factors were socialisation (SL), externalisation (EX), combination (Comb), and internalisation (INT). The data in Table 5.11 show that five

items were used to assess each of the factors. The information in Table 5.11 and Table 5.12 show that the item loadings, AVE and CR, were above the recommended thresholds of 0.70, and were statistically significant at p < 0.001.

Table 5.11. Factor loading of the knowledge creation process

Items <- Factor	Item Loading	Standard Error	T Statistics	P Values
SL1 <- Socialisation (SL)	0.75	0.12	4.53	0.000
SL2 <- Socialisation (SL)	0.71	0.12	4.33	0.000
SL3 <- Socialisation (SL)	0.70	0.11	5.82	0.000
SL4 <- Socialisation (SL)	0.80	0.19	3.75	0.000
SL5 <- Socialisation (SL)	0.75	0.12	4.53	0.000
EX1 <- Externalisation (EX)	0.87	0.13	5.07	0.000
EX2 <- Externalisation (EX)	0.82	0.03	3.92	0.000
EX3 <- Externalisation (EX)	0.78	0.01	5.13	0.000
EX4 <- Externalisation (EX)	0.82	0.13	4.19	0.000
EX5 <- Externalisation (EX)	0.75	0.02	5.20	0.000
Comb1 <- Combination (Comb)	0.79	0.05	2.64	0.000
Comb2 <- Combination (Comb)	0.86	0.04	18.24	0.000
Comb3 <- Combination (Comb)	0.87	0.19	5.07	0.000
Comb4 <- Combination (Comb)	0.77	0.04	3.24	0.000
Comb5 <- Combination (Comb)	0.75	0.12	4.53	0.000
INT1 <- Internalization (INT)	0.86	0.12	5.42	0.000
INT2 <- Internalization (INT)	0.83	0.07	5.63	0.000
INT3 <- Internalization (INT)	0.80	0.10	5.16	0.000
INT4 <- Internalization (INT)	0.76	0.19	4.38	0.000
INT5 <- Internalization (INT)	0.79	0.05	4.64	0.000

Table 5.12. Reliability and discriminant validity of the knowledge creation process

Factors	AVE	CR	SL	EX	Comb	INT

Socialisation (SL)	0.81	0.79	**0.90**			
Externalisation (EX)	0.79	0.81	0.83	**0.89**		
Combination (Comb)	0.80	0.82	0.69	0.64	**0.89**	
Internalization (INT)	0.81	0.86	0.63	0.57	0.51	**0.90**
Average variance extracted (AVE); Composite Reliability (CR)						

5.5.1.2 Organisational Resilience

The four organisational resilience factors were adaptation (Adp), innovation (Inv), agility (Agl), and robustness (Rbt). The organisational resilience factors were assessed using 12 items. The data provided in Table 5.13 and Table 5.14 show that all the item loadings, AVE and CR, as well as the correlation among factors met the threshold value of 0.70 and were statistically significant at $p < 0.001$.

Table 5.13. Factor loading of organisational resilience factors

Items <- Factor	Item Loading	Standard Error	T Statistics	P Values
Adp1 <- Adaptation	0.72	0.09	5.96	0.000
Adp2 <- Adaptation	0.75	0.12	4.53	0.000
Adp3 <- Adaptation	0.71	0.12	4.33	0.000
Adp4 <- Adaptation	0.70	0.11	5.82	0.000
Inv1 <- Innovative	0.80	0.19	3.75	0.000
Inv2 <- Innovative	0.75	0.04	2.45	0.000
Inv3 <- Innovative	0.77	0.07	3.09	0.000
Agl1 <- Agility	0.83	0.06	6.98	0.000
Agl2 <- Agility	0.78	0.01	5.13	0.000
Agl3 <- Agility	0.82	0.13	4.19	0.000
Rbt1 <- Robustness	0.75	0.02	5.20	0.000
Rbt2 <- Robustness	0.86	0.12	5.42	0.000
Rbt3 <- Robustness	0.83	0.07	5.63	0.000

Table 5.14. Reliability and discriminant validity of organisational resilience

Factors	AVE	CR	Adp	Inv	Agl	Rbt
Adaptation (Adp)	0.79	0.71	**0.89**			
Innovative (Inv)	0.81	0.65	0.873	**0.90**		
Agility (Agl)	0.80	0.61	0.51	0.31	**0.89**	
Robustness (Rbt)	0.81	0.86	0.53	0.57	0.41	**0.90**
Average variance extracted (AVE); Composite Reliability (CR)						

5.5.1.3 Organization Performance

The four organisational performance were the financial perspective (FP), internal business process perspective (IBPP), customer related perspective (CRP), and learning & growth perspective (LGP). The organisational performance factors were assessed using 17 Items. As shown in Table 5.15 and Table 5.16, all latent factor item loadings, AVE and CR met the minimum threshold of 0.70, and was statistically significant at $p < 0.001$.

Table 5.15. Factor loadings of organisational performance

Items <- Factor	Item Loadings	Standard Error	T Statistics	P Values
FP1 <- Financial Perspective	0.78	0.12	2.67	0.000
FP2 <- Financial Perspective	0.74	0.11	3.11	0.000
FP3 <- Financial Perspective	0.78	0.11	4.13	0.000
FP4 <- Financial Perspective	0.76	0.12	3.86	0.000
IBPP1 <- Internal Business Process Perspective	0.81	0.10	3.18	0.000
IBPP2 <- Internal Business Process Perspective	0.74	0.02	2.21	0.000
IBPP3 <- Internal Business Process Perspective	0.82	0.12	2.42	0.000
IBPP4 <- Internal Business Process Perspective	0.82	0.17	3.61	0.000
CRP1 <- Customer Related Perspective	0.81	0.10	3.16	0.000

CRP2 <- Customer Related Perspective	0.73	0.19	2.38	0.000
CRP3 <- Customer Related Perspective	0.85	0.11	4.19	0.000
CRP4 <- Customer Related Perspective	0.77	0.06	2.17	0.000
CRP5 <- Customer Related Perspective	0.75	0.11	3.21	0.000
LGP1 <- Learning & Growth Perspective	0.75	0.12	4.34	0.000
LGP2 <- Learning & Growth Perspective	0.71	0.12	4.21	0.000
LGP3 <- Learning & Growth Perspective	0.70	0.11	2.34	0.000
LGP4 <- Learning & Growth Perspective	0.77	0.19	3.66	0.000

Table 5.16. Reliability and discriminant validity of organisational performance

Items <- Factor	AVE	CR	FP	IBP	CRP	LGP
Financial Perspective (FP)	0.78	0.70	**0.87**			
Internal Business Process (IBP)	0.80	0.76	0.45	**0.89**		
Customer Related Perspective (CRP)	0.79	0.72	0.37	0.25	**0.89**	
Learning & Growth Perspective (LGP)	0.81	0.56	0.22	0.33	0.25	**0.90**
Average variance extracted (AVE); Composite Reliability (CR)						

5.5.2 Model Fit

The model fit precedes the structural equation model, which is used for hypotheses testing. The model fit indices were used to understand how well the factors were representative of the data. Particularly, Parsimony fit indices were used to determine the best model for the complexity, from a set of competing model (Heir et al., 2013). The two parsimony fit indices developed by Mulaik et al. (1989) were used in the present

study. The indices are the Parsimony Goodness-of-Fit Index (PGFI) and the Parsimonious Normed Fit Index (PNFI) (Mulaik et al., 1989). These two parsimony fit indices seriously penalise for model complex, which is a reason for the considerably lower parsimony fit indices than it is in other goodness of fit indices.

The maximum likelihood estimation technique was considered to be the most appropriate for the purposes of the present study. The maximum likelihood estimation is the most common method of estimation (Ferron and Hess, 2007). The following measurement criteria were adopted in the present study: (X2/df) < 3.0 (Hair et al. 2013; Kline, 2011); GFI, AGFI, NFI, CFI, TLI, IFI > 0.90(Garson, 2012, Hair et al., 2013); and RMSEA< 0.08 (Kline, 2011, Garson, 2012, Hair et al., 2013).

For GFI, AGFI, and NFI, the acceptable values should be larger than 0.90 (Hair et al. 2011; Hooper et al. 2008). However, the CFI value should be higher than 0.80 (Hair et al. 2006, 2011). Additionally, for a good fit and for RMSEA, the suggested value may range from 0.08 to 0.10 (Hooper et al. 2008). Table 5.17. contains the model fit summary.

Table 5.17. Model fit summary

Measure	Value	Supported?
Goodness of fit index (GFI)	0.91	Acceptable
Adjusted goodness of fit (AGFI)	0.92	Acceptable
Comparative fit index (CFI)	0.87	Acceptable
Normed fit index (NFI)	0.91	Acceptable
Root mean square error of approximation (RMSEA)	0.11	Acceptable

5.6   Structural Model Testing

Structural equation modelling was used to test the research hypotheses. As noted in the previous chapter, the two-tailed significance level was set at 5%. The acceptable values were $t > 1.96$ at $p < 0.05$, $t > 2.576$ at $p < 0.01$, and $t > 3.29$ at $p < 0.001$. The value of R^2 was used to understand the variance accounted for by the independent variables in the structural model. It has been observed that R^2 values of 0.75, 0.50, or 0.25 may be interpreted as substantial, moderate or weak, respectively (Hair, Ringle & Sarstedt 2011).

5.6.1   Impact of Knowledge Creation Process on Organisational Resilience

The first research question was, 'How does the knowledge creation process contribute to organisational resilience in the Saudi banking sector?' There were four hypotheses corresponding to the first research question. The first research hypothesis is 'There is a positive relationship between the knowledge creation process and organisational resilience. As noted earlier, the organisational resilience factors were adaptability, robustness, agility and innovation. As shown in in Table 5.18 and Figure 5.7, there was a statistically significant relationship between the knowledge creation process and overall organisational resilience at $p < 0.05$ and the path coefficient of 0.21. Hence, the first hypothesis was supported.

The second hypothesis is "There is a positive relationship between the knowledge creation process and adaptability". The findings show that the knowledge creation process strongly significantly affected adaptability. As shown in in Table 5.18 and Figure 5.7, the path coefficient was 0.26 with $p < 0.001$. Hence, the second hypothesis was supported.

The third hypothesis was "There is a positive relationship between the knowledge creation process and robustness". The findings in in Table 5.18 and Figure 5.7 show there was a positive relationship between the knowledge creation process and robustness. However, the effect of the knowledge creation process on robustness was not statistically significant as the path coefficient was 0.05, $p > 0.05$. Hence, the third hypothesis was rejected.

The fourth hypothesis is "There is a positive relationship between the knowledge creation process and agility". The data provided in Table 5.18 and Figure 5.7 show that the effect

of the knowledge creation process on agility was statistically significant, with path coefficients of 0.23 and p value < 0.001. Hence, the fourth hypothesis was supported.

Fifth, the researcher believed that there was a is a positive relationship between the knowledge creation process and innovation. As shown in Table 5.18 and Figure 5.7, the effect of the knowledge creation process on innovation (organisational resilience) was statistically significant at p < 0.05, and the path coefficient was 0.16. Hence, the fifth hypothesis was supported. With the R^2 being 0.37, it can be concluded that the model was able to explain 37% of the variance in organisational resilience among Saudi banks.

Table 5.18. H1.1 to H1.5 hypothesis testing

	Path	Path Mean	StDev	T value	P value	Supported?
H1.1	Knowledge Creation Process -> Organisational resilience	0.21	0.04	1.99	0.03*	Yes
H1.2	Knowledge Creation Process -> Adaptability	0.26	0.05	3.69	0.000**	Yes
H1.3	Knowledge Creation Process -> Robustness	0.10	0.05	1.19	0.323	No
H1.4	Knowledge Creation Process -> Agility	0.23	0.06	2.12	0.000***	Yes
H1.5	Knowledge Creation Process -> Innovative	0.16	0.03	1.99	0.02*	Yes
Notes:						
• **StDev: Standard deviation**						
• ***Significant at 0.05 level **, Significant at 0.01 level, *** Significant at 0.001 level**						

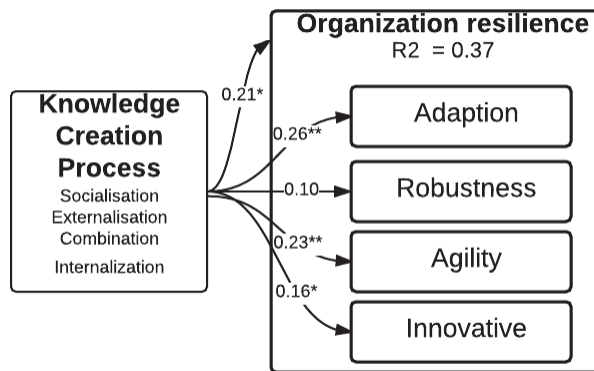*Figure 5.7. Results of the Hypothesis Testing*

5.6.2 Impact of Organisational Resilience Factors on Performance

The second research question is, 'How does organisational resilience contribute to organisational performance in the Saudi banking sector?' There were five hypotheses corresponding to this question.

The first research hypothesis was "There is a positive relationship between organisational resilience and organisational performance". The organisational performance factors were the financial perspective, the internal business process perspective, the customer related perspective, and the learning & growth perspective. Table 5.19 and Figure 5.8 show that the relationship between organisational resilience and organisational performance was statistically significant ($p < 0.001$ and path coefficient of 0.30). Hence, the second hypothesis was supported.

The second study hypothesis is "There is a positive relationship between organisational resilience and the financial perspective". The findings of the study show that the effect of organisational resilience on the financial perspective was statistically significant, as the path coefficient was 0.29 with a p value < 0.001. Hence, the second research hypothesis was supported.

The third hypothesis under the second research question is "There is a positive relationship between organisational resilience and internal business processes". The findings in Table 5.19 shows that the influence of organisational resilience on internal business processes was statistically significant, with path coefficients of 0.23 and p value < 0.05. This was sufficient evidence to support the third hypothesis.

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The fourth research hypothesis is "There is a positive relationship between organisational resilience and the customer perspective". Table 5.19 and Figure 5.8 show that the effect of organisational resilience was statistically significant, with path coefficients of 0.19 and p value < 0.05. Hence, the fourth hypothesis was supported.

The fifth hypothesis under the second research question is "There is positive relationship between organisational resilience and the learning & growth perspective". As shown in Table 5.19 and Figure 5.8, the effect of organisational resilience on the learning & growth perspective was statistically significant, with path coefficients of 0.21 and a p value < 0.05. Hence, the fifth hypothesis was upheld.

Table 5.19. H2.1 to H2.5 hypothesis testing

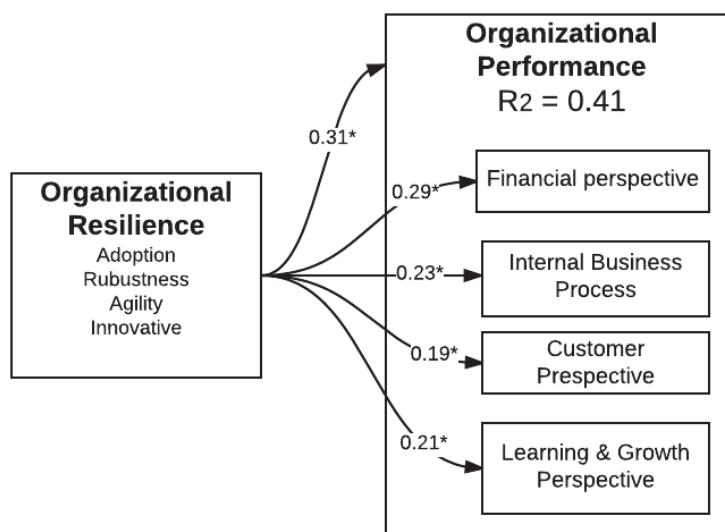|	Path	Path Mean	StDev	T value	P value	Supported?
H2.1	Organisational resilience -> organisational performance	0.31	0.06	4.09	0.000***	Yes
H2.2	Organisational resilience -> financial perspective	0.29	0.05	2.59	0.000***	Yes
H2.3	Organisational resilience -> Internal business process	0.23	0.04	1.99	0.02*	Yes
H2.4	Organisational resilience -> customer perspective	0.19	0.04	2.12	0.03*	Yes
H2.5	Organisational resilience -> Learning & Growth Perspective	0.21	0.03	1.99	0.01*	Yes
Notes: • **StDev: Standard deviation** • ***Significant at 0.05 level **, Significant at 0.01 level, *** Significant at 0.001 level**						

Figure 5.8. H2.1 to H2.5 hypothesis testing

5.6.3 Impact of Knowledge Creation Process on Performance

The third research question was, 'How does the KCP contribute to organisational performance in the Saudi banking sector?' There were five hypotheses corresponding to the third research question. The first hypothesis is "There is a positive relationship between the knowledge creation process and organisational performance". The data provided in Table 5.20 and Figure 5.9 show that the knowledge creation process statistically significantly affected the overall organisational performance ($p < 0.05$ and path coefficient of 0.29). Therefore, the first hypothesis was supported.

The second hypothesis proposed a statistically significant relationship between the knowledge creation process and the financial perspective. The data given in Table 5.20 show that there was sufficient evidence to conclude that the knowledge creation process statistically significantly influenced the financial perspective, with path coefficients of 0.31 and p value < 0.001. Therefore, the second hypothesis was supported.

The third hypothesis under research question three is "There is a positive relationship between the knowledge creation process and the internal business process perspective". The data provided in Table 5.20 and Figure 5.9 show that the influence of the knowledge creation process on the internal business process perspective was statistically significant,

with path coefficients of 0.29 and p value < 0.001. Therefore, the third hypothesis was supported.

The fourth hypothesis is "There is a positive relationship between the knowledge creation process and the customer perspective". Table 5.20 and Figure 5.9 show that the effect of the knowledge creation process on customer perspective is statistically significant, with path coefficients of 0.22 and p value < 0.05. Therefore, the fourth hypothesis was supported.

The fifth hypothesis is "There is a positive relationship between the knowledge creation process and the learning & growth perspective". As shown in Table 5.20 and Figure 5.9, the effect of the knowledge creation process on the learning & growth perspective was statistically significant, with path coefficients of 0.27 with a p value < 0.001. Therefore, the fifth hypothesis was supported.

Table 5.20. H3.1 to H3.5 hypothesis testing

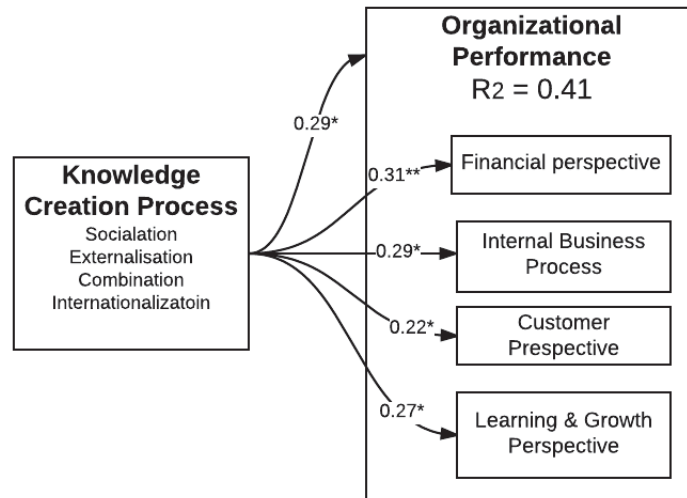|	Path	Path Mean	StDev	T value	P value	Supported?
H3.1	Knowledge creation process -> organisational performance	0.29	0.04	2.09	0.02*	Yes
H3.2	Knowledge creation process -> financial perspective	0.31	0.06	3.11	0.000***	Yes
H3.3	Knowledge creation process -> Internal business process	0.29	0.05	2.19	0.000***	Yes
H3.4	Knowledge creation process -> customer perspective	0.22	0.04	2.32	0.03*	Yes
H3.5	Knowledge creation process -> Learning & Growth Perspective	0.27	0.05	3.12	0.000***	Yes
Notes: • **StDev: Standard deviation** • ***Significant at 0.05 level **, Significant at 0.01 level, *** Significant at 0.001 level**						

Figure 5.9. H3.1 to H3.5 hypothesis testing

The study provides sufficient evidence to conclude that the model was statistically significant. With the R^2 of the organisational performance factor being 0.41, this implies that the model can account for a variance of 41% in organisational performance among Saudi banks.

5.6.4 Organisational Performance

The findings of the path testing, shown in Figure 5.10, reveal that the order of significance that the knowledge creation process factors have on organisational resilience is as follows: adaptability, followed by agility', innovation and then robustness. This is an indication that adaptability is the most important factor associated with Saudi banks' resilience in relation to organisational performance.

The findings show the order of significance that the organisational resilience factors have on organisational performance as follows: financial perspective, internal business process, learning and growth perspective and customer perspective. This indicates that financial perspective and internal business process are more likely to be associated with performance in relation to Saudi banks.

Further, the findings reveal the order of significance that the knowledge creation process factors have on organisational performance as follows: financial perspective, internal business process, learning and growth perspective and customer perspective'. This is an indication that the financial perspective and the internal business process are more likely to be associated with the performance of Saudi banks. Figure 5.10 shows the complete model results.
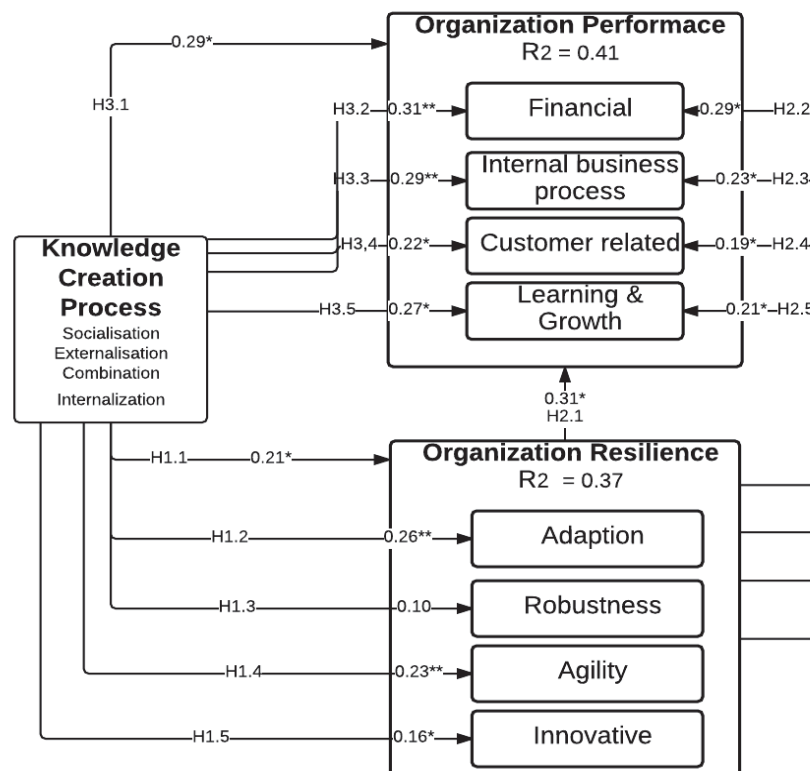

Figure 5.10. Research model results

5.6.5 Organization Resilience Mediation effect

The fourth research question was, "What is the mediating effect of organisational resilience in the relationship between the knowledge creation process and organisational performance in the Saudi banking sector?" The mediator variable mediates the effect of the predictor variable on the criterion factor (Baron & Kenny 1986). In relation to the present research study, the mediator variable was organisational resilience. Therefore, the mediating effect of organisational resilience on the relationship between the knowledge creation process and organisational performance was assessed.

The corresponding hypothesis was "Organisational resilience mediates the relationship between the knowledge creation process and organisational performance". In order to test this hypothesis, the mediation effect of organisational resilience was assessed by conducting regression models, the results of which are shown in Table 5.21.

The results of model 1, which is the regression of organisational resilience (mediator) on the knowledge creation process (predictor), show that the knowledge creation process was statistically significantly related to organisational resilience (path coefficients of 0.37; $p < 0.01$). Similarly, the results of model 2, which is the regression of organisational performance (criterion variable) on the knowledge creation process, showed that the knowledge creation process was statistically significantly associated with organisational performance (path coefficients of 0.47; $p < 0.01$).

Similar results were observed in model 3, which is the regression of organisational performance on both the knowledge creation process and organisational resilience. The findings demonstrated that the effect of organisational resilience on organisational performance was statistically significant (path coefficients of 0.33; $p < 0.05$). Moreover, the influence of the knowledge creation process on organisational performance was statistically significant (path coefficients of 0.26; $p < 0.05$). Figure 5.11 shows the mediating effect.

Overall, the results of the regression analysis demonstrate that organisational resilience mediates the relationship between the knowledge creation process and organisational performance. This is an indication that organisational resilience accounts for the relation between the knowledge creation process and organisational performance. However, the significance of the mediation effect requires other tests, such as the Sobel' z –test (Baron & Kenny 1986; PE 2013).

The results in Table 5.21 show that organisational resilience statistically significantly mediated the relationship between the knowledge creation process and organisational performance ($z = 3:13$; $p < 0.01$). The significant z -value provided sufficient evidence in support of the hypothesis. It was hypothesized that organisational resilience statistically significantly mediated the relationship between the knowledge creation process and organisational performance. The findings further showed that the index ratio was 65.1%, with the full mediation effect of organisational resilience. This suggests that variations

in organisational resilience affect the variations in the knowledge creation process that subsequently cause changes in organisational performance.

Table 5.21. Mediation effect

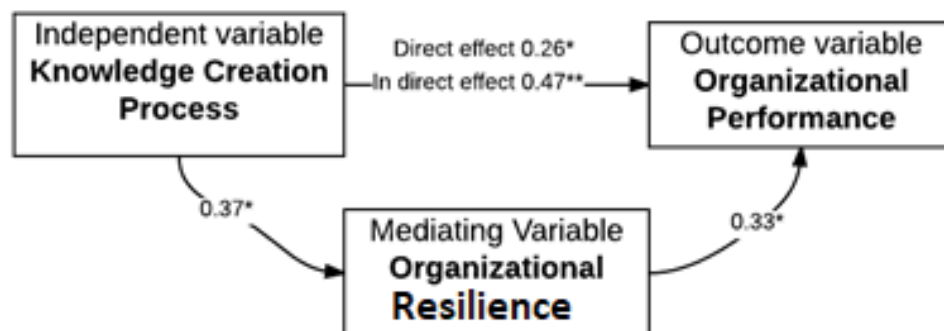| Sobel Z-value	3.13; p< 0.01
Standardized coefficient of knowledge management on organisational resilience	
Total	0.47
Direct	0.26
Indirect	0.31
Indirect to Total ratio	65.1

Figure 5.11. Mediating effect

5.7   Chapter Summary

This chapter provided the findings of the study. First, the results of the descriptive data analysis (such as the participants' demographics) and data screening (such as identifying outliers, missing data, normality assessment, etc.) were presented. The results of EFA and CFA, which were used to determine the validity, were provided. After it was found that the measurement model was acceptable, structural equation modeling was conducted to test the research hypotheses. The results of the hypothesis testing are summarized in Table 5.22.

Table 5.22. Summary of hypotheses testing

No.	Hypotheses	Outcome
H1.1	There is a positive relationship between the knowledge creation process and organisational resilience.	Supported
H1.2	There is a positive relationship between the knowledge creation process and Adaptability.	Supported
H1.3	There is a positive relationship between the knowledge creation process and robustness.	Not Supported
H1.4	There is a positive relationship between the knowledge creation process and agility.	Supported
H1.5	There is a positive relationship between the knowledge creation process and innovation.	Supported
H2.1	There is a positive relationship between organisational resilience and organisational performance	Supported
H2.2	There is positive relationship between organisational resilience and the financial perspective.	Supported
H2.3	There is positive relationship between organisational resilience and the internal business process perspective.	Supported
H2.4	There is a positive relationship between organisational resilience and the customer perspective.	Supported
H2.5	There is a positive relationship organisational resilience and the learning & growth perspective.	Supported
H3.1	There is a positive relationship between knowledge creation process and organisational performance	Supported
H3.2	There is a positive relationship between the knowledge creation process and the financial perspective.	Supported
H3.3	There is a statistically significant relationship between the knowledge creation process and the internal business process perspective.	Supported

H3.4	There is a positive relationship between the knowledge creation process and the customer perspective.	Supported
H3.5	There is a positive relationship between the knowledge creation process and the learning & growth perspective	Supported
H4.1	Organisational resilience mediates the relationship between the knowledge creation process and organisational performance.	Supported

CHAPTER 6 : DISCUSSION AND CONCLUSION

The previous chapter illustrated the findings of the quantitative stage of the study. It described the characteristics of the participants working in the Saudi Arabian banking industry, the findings of the knowledge creation process and the associated factors, organisational resilience and organisational performance including their components, followed by testing the hypotheses using factor analysis and the structural model test through structural equation modelling (SEM).

This chapter discusses the major findings revealed in the current study. It begins with an overview of the research aim and the research questions including a brief discussion as to how these were addressed, followed by a detailed review of the key findings and contributions of the study. Throughout this thesis, the research findings are presented in the context of the previous literature to assess and interpret these findings, to explore how the research compares with the existing literature, how the research gap has been addressed and how it contributes to our understanding of the issue under investigation. A complete description of the study limitations is provided next, followed by an exploration of the directions for future studies. The chapter ends with the conclusion.

6.1   Revisiting the Research Aims, Research Model, Hypotheses and Questions

This research study proposed four research questions with the aim to explore the gaps identified through a review of the literature on knowledge management, organisational resilience and organisational performance. Chapter 2, the literature review, highlighted the major findings and recommendations of the previous relevant research studies and the input of local industry experts and professionals. The concepts and key elements or dimensions of organisational resilience (adaptability, innovation, agility and robustness) and organisational performance (financial perspective, internal business process perspective, customer related perspective and learning and growth perspective) were examined with a focus on their association with knowledge management practices including the knowledge creation and sharing processes. The concept of knowledge management and the SECI (Socialisation, Externalisation, Combination and Internalization) Framework/Model of Knowledge Creation and Sharing (KCS) were also

discussed (Allal Chérif & Makhlouf 2016; Finley & Sathe 2013; Hosseini 2011; Nonaka, Toyama & Konno 2000). In particular, the literature was reviewed to investigate the contribution of knowledge management on organisational resilience and organisational performance (AlAmmary & Fung 2008; Alrawi & Elkhatib 2009; Fani & Fard 2015; Mafabi, Munene & Ntayi 2012; Rasoulinezhad 2011; Umoh & Amah 2013).

While many studies on the application and implementation of knowledge management in different contexts exist (Akhavan, Hosnavi & Sanjaghi 2009; Alavi & Leidner 2001; Andreeva & Kianto 2012; Burstein et al. 2010; Refaey 2002; Slavković & Babić 2013; Wen Chong et al. 2000), few empirical studies and documented investigation have been carried out on the influence of knowledge management practices on different aspects of organisational resilience and organisational performance in the banking industry. The available literature is confined to single factors or to non-banking sectors (Alabdan & Callen 2016; Aujirapongpan et al. 2010; Bratianu 2015; Byukusenge, Munene & Orobia 2016; Cho 2011; Chung et al. 2012). Very little relevant evidence was found in the banking context of Saudi Arabia (Alabdan & Callen 2016) however no one was found that specifically relates to the association between knowledge creation processes and organizational resilience or organizational performance in Saudi Arabia. In their study, Alabdan and Callen (2016) reviewed the existing literature to investigate the relationship between culture and knowledge management; however, their study just explained the cultural constraints in Saudi Arabia that may decrease the flow of KM within the banking industry.

Previous studies show that most often, organisations are less eager, innovative and motivated to respond promptly to complex and unanticipated situations, and to adapt to change and uncertainty in a timely manner (Skyrme 2003). Proper implementation of knowledge management is argued to play a key role in ensuring organisational resilience and performance improvement in both the public and private sector (Byukusenge, Munene & Orobia 2016; Chang & Lee 2007; Fani & Fard 2015; Darroch 2005; Mafabi, Munene & Ntayi 2012; Singh 2014; Svetina & Prodan 2008; Umoh & Amah 2013). While it has been recognised that knowledge management is pivotal to organisational resilience and performance, previous research into organisational resilience and performance has attempted to isolate single factors. Most often, the processes in which knowledge is created and shared are largely unnoticed or marginalised when it comes to uncertainty and complexity (Burstein et al. 2010; Davenport & Prusak 2000; Mao, Liu

& Zhang 2015; McElroy 2000). There are many internal and external factors related to the KM environment and knowledge creation processes that can hinder or facilitate organisational resilience and organisational performance (Baghbanian et al. 2012; Baghbanian, Torkfar & Baghbanian 2012; Borgonovo 2006).

While several studies have outlined (knowledge) theories about the factors that improve organisational resilience and organisational performance (Choi, Poon & Davis 2008; Matayong & Mahmood 2013), very few empirical studies have investigated if and how knowledge management affect organisational resilience and organisational performance from a knowledge creation and sharing perspective (Ramírez, Morales & Rojas 2011; Sankowska 2013; Tubigi, Alshawi & Alalwany 2013). The study of organisational resilience and organisational performance within the context of the banking industry is important and invites us to reconsider both theory and practice.

The research gap and theoretical foundations rooted in the previous literature guided the researcher's choice of a preliminary conceptual model and suggested a list of variables to consider in that model. The study aims, questions and hypotheses were then developed. Using a mixed-method approach, an empirical research study was conducted to explore the impact of knowledge creation and sharing linked to Nonaka and colleagues' SECI framework (Finley & Sathe 2013; Nonaka, Toyama & Konno 2000) on organisational resilience and organisational performance.

To achieve this research aim, the following four research questions and hypotheses were developed:

1. **How does KCP contribute to organisational resilience in the Saudi banking sector?**

H. There is a positive relationship between the knowledge creation process and organisational resilience

    1.1. H1.2 There is a positive relationship between the knowledge creation process and adaptability.

    1.2. H1.3 There is a positive relationship between the knowledge creation process and robustness.

1.3. H1.4 There is a positive relationship between the knowledge creation process and agility.

1.4. H1.5 There is a positive relationship between the knowledge creation process and innovation.

2. **How does KCP contribute to organisational performance in the Saudi banking sector?**

H. There is a positive relationship between the knowledge creation process and organisational performance

2.1. H2.2 There is a positive relationship between the knowledge creation process and the financial perspective

2.2. H2.3 There is a positive relationship between the knowledge creation process and the internal business process perspective.

2.3. H2.4 There is a positive relationship between the knowledge creation process and the customer perspective.

2.4. H2.5 There is a positive relationship between the knowledge creation process and the learning & growth perspective.

3. **How does organisational resilience contribute to organisational performance in the Saudi banking sector?**

H. There is a positive relationship between organisational resilience and organisational performance

3.1. H3.2 There is a positive relationship between organisational resilience and the financial perspective.

3.2. H3.3 There is a positive relationship between organisational resilience and the internal business process perspective.

3.3. H3.4 There is a positive relationship between organisational resilience and the customer perspective.

3.4. H3.5 There is a positive relationship between organisational resilience and the learning and growth perspective.

4. **What is the mediating effect of organisational resilience in the relationship between KCP and organisational performance in the Saudi banking sector?**

4.1. H4.1 Organisational resilience mediates the relationship between the knowledge creation process and organisational performance.

6.2 Discussion of the Major Research Findings

The following discussion describes how each of the aforementioned research questions and the associated hypotheses were addressed in the thesis. The results of the data analysis created mixed findings for the listed hypotheses. While the results, in some respects, were consistent with the previous findings, some were unique to the present study and contradicted the previous research.

6.3 Quantitative Study Assessment

The quantitative analysis of the data resulted in the following findings.

The first hypothesis to be tested related to the relationship between the knowledge creation process and organisational resilience, including its dimensions. As discussed in Chapter 5, by using factor analysis and structural equation modelling, four factors were extracted from the organisational resilience construct. These four factors were adaptability, robustness, agility, and innovation, each with four, three, three, three items/questions, respectively.

To answer RQ1 and address its related hypothesis H1 and sub-hypotheses H1.1 to H1.4, the correlation test and SEM found a significant and positive association between the knowledge creation process and overall organisational resilience, meaning that KCP is associated with organisational resilience; therefore hypothesis H1 is supported. In particular, the sub-hypothesis analyses revealed that with the exception of robustness as a variable, other dimensions of organisational resilience i.e. adaptation, agility and innovation, correlated positively and significantly with the knowledge creation process. Specifically, KCP was found to influence the adaptation, with the strongest path co-efficiencies compared to the others, followed by the influence of the knowledge creation process on agility (organisational resilience) and innovation (organisational resilience). While KCP was positively and statistically significantly influential in the resilience dimensions of organisations (i.e. adaptability, agility and innovation), no association was found between KCP and robustness, suggesting that H1.1, H1.3 and H1.4 are supported. The robustness dimension was therefore removed from the model as it did not show any significant relationship with KCP.

In relation to organisational resilience and the dimensions of adaptability, agility and innovation, this study found that the knowledge creation process is effective in organisational resilience. The findings indicate that KCP plays a key role in organisational resilience, therefore, organisations should recognise this role and implement strategies and techniques that promote knowledge creation and sharing practices so that they can constantly adapt to change and uncertainty in the ever-changing environment. Research scholars argue that social interactions and the appropriate conversion of different types of knowledge (tacit vs. explicit) are at the core of knowledge management activities (Baghbanian 2010; Burstein et al. 2010; Virtanen 2011).

These findings confirmed previous research findings that were based exclusively on survey data, and provided supplementary discussions on the role of knowledge creation processes on organisational agility, adaptation and innovation (Chung et al. 2012; Dove 1999a; Kuei-Hsien 2010; Popadiuk & Choo 2006; Riordan 2013). The study findings however did not support the relationship between KCP and robustness. Valiant (2008a), for example, argued that creating intelligent systems relies on integrating knowledge infusion mechanisms that can guarantee robustness.

While the study findings disclosed that most respondents agreed that the Saudi Arabian banking industry use available knowledge to maintain its (healthy and strong) position and provide solutions to problems, the results did not reveal any significant relationship between KCP and robustness. This phenomenon can be explained by the fact that individuals or collective individuals may find it difficult to produce knowledge and share their experiences with others within their organisations to ensure the robustness of the banking industry. Another possible reason is that the technological infrastructure may not be strong enough to facilitate knowledge creation and sharing in that limited access to data and information may hinder organisations from responding appropriately to unforeseen circumstances. From a different angle, a lack of trust in the relationships among employees may discourage them in sharing their knowledge and experiences and this may, in turn, inhibit organisational robustness (Sankowska 2013). Such a belief implies that organisations need to invest more time and effort in establishing trust among their staff to achieve strong results in knowledge-sharing and suitability.

The second hypothesis to be tested related to the relationship between knowledge

creation process and organisational performance including its dimensions. As discussed in Chapter 5, by using factor analysis and structural equation modelling, four factors were extracted from the organisational performance construct. These four factors were financial perspective, internal business process, customer perspective and learning and growth perspective, each with four, four, five, four items/questions, respectively.

To answer RQ2 and address its related hypothesis H2 and sub-hypotheses H2.1 to H2.4, a correlation test and SEM found a significant, direct and positive association between the knowledge creation process and organisational performance. The findings from the Saudi Arabian samples revealed strong statistical support for the direct and positive effect of the knowledge creation process on the overall organisational performance as well as its dimensions. This means that KCP is associated with organisational performance and therefore hypothesis H2 is supported. More specifically, statistically significant support was found for hypothesis H2.1 to H2.4, which argues the effects of KCP on the performance aspects of the organisations i.e. financial perspective, internal business process, customer perspective, and learning and growth perspective. This means that individuals from the Saudi Arabian banking industry believe that KCP is most important in these aspects of organisational performance.

KCP was found to influence the financial aspect of organisational performance, with the strongest path co-efficiencies among the others, followed by the influence of the knowledge creation process on the internal business process (organisational performance). Since KCP was a positively and statistically significant influential factor in the performance dimensions of the organisations, all the dimensions were therefore included in the model due to their significant relationship with KCP. In relation to organisational performance and its dimensions, this study found that the knowledge creation process is effective in organisational performance, suggesting that organisations should recognise the role of the knowledge creation process in their performance and implement strategies and techniques that promote knowledge creation and sharing practices so that they can constantly improve their performance in the ever-changing environment. These findings are consistent with prior studies on the effectiveness of knowledge creation and sharing processes in organisational performance (Andreeva & Kianto 2012; Burstein et al. 2010). In their empirical study, Andreeva & Kianto (2012) demonstrated an actual relationship between knowledge management activities and organisational outcomes. They argue that human resource management and information

communication technology are the prerequisites for managing knowledge and that there is a strong correlation between knowledge management practices and both the financial performance and competitiveness of the companies, suggesting that knowledge management activities could improve the financial performance of organisations. Research scholars argue that interactions across organisations and the appropriate conversion of different types of knowledge (tacit vs. explicit) are at the core of knowledge management activities (Finley & Sathe 2013; Hosseini 2011; Jones 2001; Sankowska 2013). Yet, these studies are largely outside the domain of the banking sector.

The third hypothesis to be tested related to the relationship between organisational resilience and organisational performance including its dimensions. Using factor analysis and structural equation modelling, four factors were extracted from the organisational performance construct. The relationship analysis showed that there is a positive relationship between organisational resilience and organisational performance including the four perspectives of the BSC (i.e. financial perspective, internal business process, customer perspective, and learning and growth perspective). The strongest path co-efficiencies were found between the overall organisational resilience and organisational performance followed by the financial perspective. These findings suggest that organisational resilience is associated with an increase or decrease in total organisational performance and is primarily associated with the financial perspective of organisational performance and other dimensions of organisational performance. In other words, organisational resilience was the most positively influential factor on organisational performance. These findings were based on the detailed correlation analysis and SEM outlined in Chapter 5. Since the study findings supported H3 and H3.1 to H3.4, we therefore conclude that the hypotheses were proven.

These findings support previous research indicating that resilient individuals or organisations are better able to cope with challenges, change and uncertainty than non-resilient people or systems. For them, the resilience-enhancing practices have the potential to contribute to individuals' psychological capital, attitudes and behaviour, and to organisational performance both during turbulent circumstances and during periods of relative calm (Bardoel et al. 2014; Cooper, Liu & Tarba 2014). Such a finding suggests that an organisation's authorities should include formal resilience training in their daily practices in order to improve their organisations' overall performance.

To answer RQ4 and address its related hypothesis H4, a correlation test, regression analysis and SEM were used. The relationship analysis showed that organisational resilience has a mediating effect on the relationship between KCP and organisational performance in the Saudi banking sector, hence H4 is strongly supported.

This result indicates that organisational resilience is significantly moderately correlated with both KCP and organisational performance and suggests that improved organisational performance involves the proper implementation and application of knowledge creation and sharing processes through the appropriate use of resilient practices in organisations. Therefore, changes introduced and stimulated by organisations should involve the incorporation of knowledge management practices that attempt to increase organisational performance, such as financial indices, internal business processes, customer satisfaction and improved learning and growth aspects. This finding is unique to the banking industry in this study, suggesting that the contribution of knowledge creation processes to organisational performance can be mediated by an individual's perceptions of her/his ability to cope with change or an organisation's capability to respond to unforeseen circumstances.

6.4   Study Contributions

The knowledge creation and sharing process, organisational resilience and organisational performance have been well researched, though in isolation or limited to single contexts, in many previous studies. Very few studies exist or were found to empirically investigate the knowledge creation process, organisational resilience and organisational performance in the banking industry.

New research studies should advance the existing body of current knowledge in the field. This empirical research was conducted to provide a theoretical synthesis and explanation of the KCP and organisational resilience and organisational performance together, and also to provide theoretical and practical contributions for improved organisational performance and resilience within Saudi Arabia from an organisational banking prospective. The specific contributions of this study to the current body of literature are as follows.

- Several findings were unique to the current study: it is novel in its conduct of organisational resilience, organisational performance and KCP together in the

banking industry and more specifically in Saudi Arabia and adopts a more sophisticated methodical approach to that employed in previous studies. Its findings are novel in the sense that banking staff acknowledged the significance of KCP as a key factor in the improved resilience and performance of their organisations. Previous studies had largely isolated single factors or been limited to single contexts or fields as indicated above.

- This empirical research study provided evidence of the statistically significant relationships that exist between the three key study variables, namely the knowledge creation process, organisational resilience and organisational performance as well as the dimensions of these variables.

- Additional empirical evidence supported the argument that the KCP including its dimensions of SCEI were positively influential in banking organisational resilience and performance in Saudi Arabia. The knowledge creation process, with the exception of robustness, has an influence on different aspects of organisational resilience (i.e. adaptation, agility and innovation) and different facets of organisational performance (i.e. financial perspective, internal business process, customer perspective and learning and growth perspective). As a result of these findings, this empirical research study drew attention to the importance of KCP in organisational resilience and performance in the banking sector.

- The current study empirically developed a reliable and valid measurement scale for three theoretical constructs (KCP, organisational resilience and organisational performance) that can be confidently employed in knowledge management practices as well as organisational resilience and performance, particularly in the Saudi organisational context.

- To the best of our knowledge, no research studies have investigated the influence of KCP on both organisational resilience and performance within a specific organisational country setting (such as Saudi Arabia). The current study fills this gap, providing evidence that the application of KCP in the banking industry can improve organisational resilience and performance.

- The data collection and analysis process of the present research study showed a demand for more detailed research and further investigation at the organisational level where the experiences of different staff in different roles can provide further understanding of the current study's main results.

- Through an extensive literature review and analysis of the relevant theories, models and frameworks, the present study identified a list of selected knowledge creation and sharing processes from Nonaka and colleagues' knowledge conversion theory (based on the SCEI framework) and selected components from organisational resilience and performance, and examined the influence of the KCPs that could contribute to the improvement of an organisation's performance and resilience.

- This empirical research study was specifically conducted in the banking industry of Saudi Arabia, a developing country that is initiating principles, theories and concepts of knowledge management and aims to improve its organisational resilience and performance. Very little research evidence, to the best of our knowledge, has been dedicated to exploring these concepts together. This research study can serve as a foundation for an in-depth understanding of knowledge creation and sharing practices, organisational resilience and organisational performance.

- The present research study added theoretical and practical knowledge to the growing body of research by demonstrating that knowledge management practices influenced the resilience capability and performance of the banking industry through knowledge creation and sharing in Saudi Arabia as a developing country.

- This empirical research study fills the existing gap in the previous literature on the influence of KCPs on organisational resilience and performance and the contribution that it can make to the Saudi Arabian banking industry.

6.5   Implications for Theory and Practice

The effects of knowledge creation and sharing processes on the organisational resilience and organisational performance of the banking industry is important and invites us to consider both theory and practice. Through a quantitative research design, this study proposed a conceptual model that could significantly demonstrate the influence of KCPs on organisational resilience and performance, including their associated dimensions, in the Saudi Arabian banking sector. The research implications of the current study are presented as follows.

The first theoretical implication of the study is the development of a triangulation model

of KCP, organisational resilience and organisational performance that can be used in future studies. The current study therefore contributes to the existing body of scientific knowledge by proposing an updated model that indicates the influence of KCPs on organisational resilience and performance. In addition, this study extended the previous literature in these fields and provided significant findings that could address the shortcomings of the prior research by applying organisational resilience as a moderator to the proposed model to discover new and improved methods for nurturing organisational performance through KCP.

Furthermore, this study provided an understanding of the importance of knowledge creation processes in organisational resilience and performance; specifically, the importance of the major elements of knowledge creation and sharing processes i.e. socialisation, externalisation, combination and internalization on different dimensions of organisational resilience and performance.

Additionally, this study contributed to the validation of the survey instrument of the various variables or factors employed in the proposed model. Since a new population (Saudi Arabia) was applied to all these variables or factors, the reliability and validity of all the constructs were assessed in this context. Research scholars can now use the survey instrument with increased confidence in the banking context.

Finally, the various hypotheses examined and supported in this study all added to the existing research on developing hypotheses for further analytical studies. This study examined how changes in KCP can affect organisational resilience and performance within the banking industry. While the study did not verify the validity of the proposed model, it is the first research to investigate the influence of KCPs on both organisational resilience and performance within the banking industry of a developing country i.e. Saudi Arabia.

The current research study examined the relationship between KCPs and organisational resilience and organisational performance in the Saudi Arabian banking industry and attempted to develop a direct cause and effect model. It remains to be tested.

The findings also provided some practical implications for executives, decision-makers and researchers to enhance organisational performance and organisational resilience through KCPs in the banking sector. The results of this study may help bank managers modify their approach to knowledge management practices if they use the insights of this

research, and increase the outcome of their organisations by focusing on the relationship between KCPs and organisational resilience and organisational performance.

Top management facilitation and leadership of knowledge creation and sharing is important in the banking sector as a superior capability in knowledge management will allow them to succeed in organisational resilience and performance. The practical implications also extend to business where it is recommended that changes are made to their market strategies to improve their organisational resilience and performance.

6.6   Limitations of the Study and Recommendations for Future Research

The limitations of this study and its recommendations for the direction of future studies are as follows:

This study focused on knowledge creation processes, organisational resilience and organisational performance in the banking sector of Saudi Arabia. It addressed the extent to which knowledge creation processes influence organisational resilience and performance, including their varied dimensions. However, no comparison was made with any other similar or different settings in other developing or developed country due to time and financial constraints. More research is recommended in different settings.

Similar to any other study, the sample and context are the key methodological issues for researchers. In relation to this study, focusing on a single industry and a limited number of organisations in Saudi Arabia may contribute to the generalisability of its findings. Future research is recommended to consider a larger sized sample from different sectors and industries. Such knowledge would definitely contribute to our understanding of the association between knowledge creation and organisational variables in Saudi Arabia. The findings of this study however may be used tentatively in countries with Arabic language. While there might be some cultural and religious similarities between Saudi Arabia and Arab countries in Middle East the its economic power has raised fundamentally, largely due to its economic structure which is heavily reliant on export of only oil and oil-related products, compared to others (Mahish 2016).

The findings obtained in the current research were based on and derived from the empirical analysis of the data collected from the questionnaires. While attempts were made to ensure that all measurement items were instantly recognisable through the questionnaire, the researcher had no control over the participants' interpretation and

perceptions of each item. Such a condition may or may not reflect the actual situation. Future studies are recommended to use measurable variables from different data sources and apply different research designs to minimise the effects of any response bias.

It is also recommended that future research be undertaken into examining the causal relationship that was found between the study variables to have a better understanding of the effect of each variable and its direct and indirect link with the other variables.

6.7   Conclusion

In this study, the staff employed at a number of Saudi Arabian banks were surveyed to explore any possible associations/correlations between KCPs and organisational resilience and performance factors. The findings showed the statistically significant contribution of KCPs to overall organisational resilience and organisational performance in the banking system in Saudi Arabia.

The current research study hypothesised that knowledge creation processes i.e. socialisation, externalisation, combination and internalization, influence the various elements of organisational resilience (adaptability, innovation, agility and robustness) and organisational performance (financial perspective, internal business process perspective, customer related perspective and learning and growth perspective). It was also postulated that organisational resilience and its elements play a mediating role in the contribution of KCPs to organisational performance in the Saudi banking sector.

The current research study was conducted in response to the need to examine the relationships among the aforementioned variables. While there are a few research studies on these topics in isolation, no research studies exist that comprehensively examine the relationships among all of these variables in the banking system through a single study across the world and more specifically in the Saudi Arabian context. The present study, consequently, provided significant data and background information to address the current gap in the existing knowledge. With the exception of robustness as an element of organisational resilience, all other objectives and hypotheses of the research were met. The study has a number of theoretical and practical implications that extend beyond the

previous studies. It suggested that knowledge creation processes would influence organisational resilience and performance, and assist in the improved performance of organisations through organisational resilience across the Saudi Arabian banking system.

Following an extensive review of the literature and relevant models or frameworks, a conceptual model was proposed that highlighted/described the contribution of knowledge creation processes to organisational resilience and organisational performance as well as the relationships among them.

To examine the research model and hypotheses, a questionnaire survey was administered to collect data from staff working in the Saudi Arabian banking industry. The data were later imported into the SPSS software for analysis. Using different quantitative techniques, such as SEM including EFA, CFA as well as correlation and regression analyses, the current research study added more academic understanding and experience to the current body of literature by providing empirical evidence on the relationships among the study variables.

More specifically, the study findings indicated knowledge creation and sharing processes are positively related to the overall organisational resilience and performance and that organisational resilience plays a key role in the influence of knowledge creation processes in relation to organisational performance. These findings, therefore, have theoretical and practical implications for those who are working in the banking industry by offering recommendations that are in line with knowledge creation practices.

With the exception of robustness, the results provided support all of the study's hypotheses and validated the empirical model derived from the survey. Finally, the current research recommended further directions for future research to extend the findings obtained in this study.

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APPENDIX

Appendix A The English survey version

The screen shot of survey homepage

Dear Participant,

This study is being conducted as a part for my research degree. The purpose of the study is to learn the relationship between knowledge creation process, organizational resilience, and firm performance in the Saudi Enterprise. Participation in this research study is completely voluntary. You have the right to withdraw at any time or refuse to participate entirely. The results from this project will help us understand knowledge creation process for improving of organizational resilience and firm performance in Saudi Banks. The questionnaire should take no more than 10 minutes.

The researcher believes that there is little, or no risk associated with your participation. Your responses will be kept completely confidential and will only be used for academic purpose. Participation in this research study is completely voluntary. You have the right to withdraw at any time or refuse to participate entirely. If you agree to be part of the research and to research data gathered from this survey to be published in a form that does not identify you, please continue with answering the survey questions.

If you have concerns about the research that you think I or my supervisor can help you with, please feel free to contact me (us) on +61 2 9514 1809. Or via emails: Igor.Hawryszkiewycz@uts.edu.au, Ali.A.Alharthy@student.uts.edu.au

1. Gender, Male/Female

2. Citizen, Saudi/Non-Saudi

3. What is your Age group: 18-25, 26-35, 36-45, Above 45

3. Current level of Education: High school, Diploma,Bachelor's Degree, Master's Degree, PhD

4. What is the major function of your job: Retail Banking, Corporate & Investment Banking, Islamic Banking, Risk Management, Financial Control, Global Operations [Compliance/Management], Human Resouce, Information Technology & System, Learning & Development, Marketing & Brand Management, Legal & Corporate Affairs.

5. Experience: Less than one year, 1 – 3 years, 3 – 5 years, More than 5 years.

The questions below were answered on a five-point Likert-type scale.

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree

	Knowledge Creation Process					
A. Socialization (SL)						
SL1	During discussion, I try to find out others' opinions, concepts, thoughts or ideas	○	○	○	○	○
SL2	During discussion, I often encourage others to express their concepts, thoughts or ideas	○	○	○	○	○
SL3	My colleagues and I will actively share life or work experience with each other	○	○	○	○	○
SL4	I gather information from other departments	○	○	○	○	○
SL5	Before discussion, I will collect necessary information and show it to my colleagues.	○	○	○	○	○
B. Externalization (EX)						
EX1	When others can't understand me, I am usually able to give him/her examples to help explaining	○	○	○	○	○
EX2	Most of the time, I can transcribe some of the unorganized thoughts into concrete ideas	○	○	○	○	○
EX3	I tend to describe professional or technical terms with conversational language to help communication.	○	○	○	○	○
EX4	I tend to use analogy when expressing abstract or (theoretical) concepts.	○	○	○	○	○
EX5	Our team develops new ideas through constructive	○	○	○	○	○

	dialogue by using figures and diagrams.					
C. Combination (Comb)						
Comb1	During the discussion, I tend to help organize ideas and make conclusion to facilitate the discussion	○	○	○	○	○
Comb2	When coming across problems, I tend to use my experience to help solving problems	○	○	○	○	○
Comb3	After every event, I have the habit of organizing and making summary of what happened	○	○	○	○	○
Comb4	During discussion, I will organize everyone's thoughts in my mind	○	○	○	○	○
Comb5	I like to collect new information, and making connection of new and old knowledge to work up new concepts.	○	○	○	○	○
D. Internalization (INT)						
INT1	After hearing a new idea or concept, I tend to compare it with my experience to help me comprehend the meaning.	○	○	○	○	○
INT2	I understand others' thoughts better by repeating what they said and asking them "Is this what you mean.	○	○	○	○	○
INT3	I will tell others what I think to make sure my understanding is the same as theirs.	○	○	○	○	○
INT4	When I have finished saying something, I will ask the other person if it is necessary to repeat to make sure he/she	○	○	○	○	○

	understands exactly what I mean.					
INT5	When communicating with others, I will give others time to think about what we just discussed.	○	○	○	○	○
Organization resilience						
A. **Adaptability (Adp)**						
Adp 1	The bank that I work for, its services conform to the regulatory standards.	○	○	○	○	○
Adp 2	In the bank that I work for, we have made service delivery more flexible.	○	○	○	○	○
Adp 3	The bank that I work for its service delivery is in line with our customers' needs.	○	○	○	○	○
Adp 4	In the bank that I work for, we have maintained our bank's reputation.	○	○	○	○	○
B. **Innovative (Inv)**						
Inv1	We provide unique products and services to our customers.	○	○	○	○	○
Inv2	We bundle products and services creatively.	○	○	○	○	○
Inv3	We offer new customer support services.	○	○	○	○	○
C. **Agility (Agl)**						
Agl1	We continually sense and detect customer and marketplace opportunities	○	○	○	○	○
Agl2	We respond quickly to dynamic business.	○	○	○	○	○
Agl3	We react rapidly to competitors' market actions.	○	○	○	○	○

	D. Robustness (Rbt)					
Rbt1	The bank that I work for stands straight and preserves its position.	○	○	○	○	○
Rbt2	The bank that I work for is successful in generating diverse solutions.	○	○	○	○	○
Rbt3	The bank that I work for does not give up and continues its path.	○	○	○	○	○
Organization Performance						
A. Financial Perspective (FP)						
FP1	The bank that I work for has improved its asset utilization.	○	○	○	○	○
FP2	The bank that I work for its net income has increased.	○	○	○	○	○
FP3	The bank that I work for its sales have increased.	○	○	○	○	○
FP4	The bank that I work for its market value has increased.	○	○	○	○	○
B. Internal Business Process Perspective (IBPP)						
IBPP 1	The bank that I work for has improved our quality control processes.	○	○	○	○	○
IBPP 2	The bank that I work for has improved our service/product delivery processes.	○	○	○	○	○
IBPP 3	The bank that I work for has developed policies and procedures to increase customer satisfaction.	○	○	○	○	○
IBPP 4	The bank that I work for has consistently follows service/product quality protocols.	○	○	○	○	○
C. Customer-Related Perspective (CRP)						

CRP1	The bank that I work for, has improved the number of services/products that it provides.	○	○	○	○	○
CRP2	In the bank that I work for, the number of people who use its services/products has increased	○	○	○	○	○
CRP3	In the bank that I work for, the demand for its services/products has increased	○	○	○	○	○
CRP4	The bank that I work for, introduces innovative and unique functional services/products more often than our competitors.	○	○	○	○	○
CRP5	The bank that I work for has better R&D cycle time for services/products than our competitors (length of time from conception to introduction).	○	○	○	○	○
D. Learning & Growth Perspective (LGP)						
LGP1	I receive enough information to perform my job.	○	○	○	○	○
LGP2	I have enough information to make optimal decisions to accomplish my performance objectives.	○	○	○	○	○
LGP3	The bank that I work for provides the training that I need to meet my job requirements.	○	○	○	○	○
LGP4	The bank that I work for provides training that is linked to bank goals and objectives.	○	○	○	○	○

السلام عليكم ورحمة الله وبركاته

عزيزي موظف البنك... تحية طيبة وبعد،

تجرى هذه الدراسة كأحد متطلبات الحصول على درجة الدكتوراه في نظم المعلومات. ويمثل هذا الاستبيان أحد الجوانب الهامة في البحث، ويهدف إلى اكتشاف العلاقة بين كلاً من عملية إنشاء المعرفة، المرونة، والاداء في البنوك السعودية.

المشاركة في هذه الدراسة البحثية هي عمل تطوعي بالكامل، ولديكم الحق في الانسحاب في أي وقت أو رفض أو رفض المشاركة كليا. نتائج هذا البحث سوف تساعد البنوك السعودية على فهم دور إنشاء المعرفة في تحسين مرونة وأداء البنوك السعودية.

يرجى العلم أن جميع الأسئلة المطروحة ضمن هذا الاستبيان لأغراض البحث العلمي وأن إجاباتكم ستكون محاطة بالسرية الكاملة والعناية العلمية الفائقة. فأرجو التكرم والإجابة على الأسئلة المطروحة وتزويد الباحث بآرائكم القيمة من خلال وضع إشارة (✓) على الإجابة التي ترونها ملائمة. إكمال الاستبيان لن يزيد عن 10 دقائق.

شكرا لتعاونكم وحسن استجابتكم....

القسم الأول : **معلومات عامة**

يرجى الإجابة على الأسئلة التي تتضمن معلومات عامة بوضع إشارة (✓)

1- الجنس:
☐ مذكر , ☐ مؤنث

2- الجنسية:
☐ سعودي , ☐ غير سعودي

3- الفئة العمرية:
☐ أكثر من 45 سنة , ☐ من 36 إلى 45 , ☐ من 26 إلى 35 سنة ☐ أقل من 26 سنة ,

4- المؤهل العلمي:
☐ الثانوية العامة , ☐ دبلوم , ☐ بكالوريوس , ☐ ماجستير , ☐ دكتوراه

5-   الدور الوظيفي:

☐ الخدمات المصرفية للأفراد

☐ الخدمات المصرفية للشركات والاستثمار

☐ الخدمات المصرفية الإسلامية

☐ إدارة المخاطر

☐ الرقابة المالية

☐ العمليات العالمية

☐ الموارد البشرية

☐ تكنولوجيا المعلومات والنظام

☐ التعليم والتطوير

☐ التسويق وإدارة العلامة التجارية

☐ الشؤون القانونية

a. الخبرة العملية:

☐ أقل من سنة

☐ من 1 – 2 سنوات

☐ من 2 – 3 سنوات

☐ من 3 – 5 سنوات

☐ أكثر من 5 سنوات

القسم الثاني:

يحتوي هذا القسم على ثلاث محاور انشاء المعرفة و المرونة والاداء ، يرجى التكرم باختيار الإجابة المناسبة بعد قراءة العبارات الآتية:

معارض بشدة	معارض	محايد	أوافق	أوافق بشدة	المحور الأول: ـ عملية إنشاء المعرفة	
○	○	○	○	○	خلال النقاش، أحاول التعرف على الآراء ومفاهيم وأفكار الآخرين.	SL1
○	○	○	○	○	خلال النقاش، غالبا ما أشجع الآخرين على التعبير عن آرائهم ومفاهيمهم وأفكارهم.	SL2
○	○	○	○	○	أنا وزملائي نتبادل الخبرات في الحياة والعمل مع بعضنا البعض.	SL3
○	○	○	○	○	أقوم بجمع المعلومات من الإدارات الأخرى.	SL4
○	○	○	○	○	قبل النقاش، اقوم بجمع المعلومات الضرورية واعرضها على زملائي.	SL5
○	○	○	○	○	عندما لا يستطيع الآخرون فهمي، في العادة اكون قادر على اعطائهم أمثلة للمساعدة في التوضيح	EX1
○	○	○	○	○	في معظم الاحيان، استطيع تدوين بعض الأفكار غير المنظمة إلى أفكار محددة	EX2
○	○	○	○	○	أنا أميل لوصف المصطلحات المهنية أو الفنية مع لغة التخاطب للمساعدة في التواصل.	EX3
○	○	○	○	○	أقوم بتسهيل محادثة خلاقة وبناءة بين أعضاء المجموعة.	EX4
○	○	○	○	○	فريقنا يطور أفكار جديدة من خلال الحوار البناء باستخدام الأرقام والرسوم البيانية.	EX5
○	○	○	○	○	خلال النقاش، أميل إلى مساعدة في تنظيم الأفكار وعمل خاتمة لتسهيل النقاش.	Comb1
○	○	○	○	○	عند مصادفة المشاكل، أميل إلى استخدام خبرتي للمساعدة في حل المشاكل.	Comb2
○	○	○	○	○	بعد كل حدث، لدي عادة تنظيم وعمل ملخص لما حدث.	Comb3
○	○	○	○	○	خلال النقاش، اقوم بتنظيم افكار كل شخص في عقلي.	Comb4
○	○	○	○	○	أحب جمع معلومات جديدة، وانشاء رابط بين معارفي الجديدة والقديمة للخروج بمفاهيم جديدة.	Comb5

معارض بشدة	معارض	محايد	أوافق	أوافق بشدة		
○	○	○	○	○	بعد الاستماع إلى فكرة جديدة أو مفهوم جديد، أميل إلى مقارنتها مع خبراتي لتساعدني في فهم المعنى.	INT1
○	○	○	○	○	أنا أفهم أفكار الآخرين أفضل من خلال تكرار ما قالوا وسؤالهم "هل هذا ما تقصدون؟"	INT2
○	○	○	○	○	أقول للآخرين ما أعتقد لكي أتأكد أن ما أفهمه هو نفس ما يفهمونه.	INT3
○	○	○	○	○	عندما انتهي من قول شئ ما، أطلب من شخص آخر(إذا كان ذلك ضروريا) تكرار ما ذكرته للتأكد من انه فهم بالضبط ما اعنيه.	INT4
○	○	○	○	○	عندما اتواصل مع الآخرين، أعطي الآخرين وقت للتفكير في ما ناقشناه.	INT5
معارض بشدة	معارض	محايد	أوافق	أوافق بشدة	المحور الثاني:- المرونة التنظيمية	
○	○	○	○	○	البنك الذي أعمل له، خدماته التي يقدمها تتفق مع المعايير التنظيمية.	Adp1
○	○	○	○	○	في البنك الذي أعمل له، تقديم الخدمات أكثر مرونة.	Adp2
○	○	○	○	○	في البنك الذي أعمل له، حافظنا على سمعة البنك.	Adp3
○	○	○	○	○	البنك الذي أعمل له، خدماته المقدمة تتماشى مع احتياجات عملائنا.	Adp4
○	○	○	○	○	نحن نقدم منتجات وخدمات فريدة لعملائنا.	Inv1
○	○	○	○	○	نقدم حزم الخدمات والمنتجات بشكل خلاق.	Inv2
○	○	○	○	○	نقدم خدمات دعم لعملاء البنك الجدد.	Inv3
○	○	○	○	○	نحن باستمرار نستشعر ونبحث عن العملاء وفرص السوق.	Agl1
○	○	○	○	○	نحن نستجيب بسرعة الى متغيرات العمل.	Agl2
○	○	○	○	○	نحن نرد بسرعة على الإجراءات السوقية لمنافسينا.	Agl3
○	○	○	○	○	البنك الذي أعمل له، يقف على قدميه ويحافظ على موقعه.	Rbt1
○	○	○	○	○	البنك الذي أعمل له، ناجح في خلق الحلول المتنوعة.	Rbt2

معارض بشدة	معارض	محايد	أوافق	أوافق بشدة		
○	○	○	○	○	البنك الذي أعمل له لا يستسلم ويستمر في مساره.	Rbt3
معارض بشدة	معارض	محايد	أوافق	أوافق بشدة	المحور الثالث:- الاداء التنظيمي	
○	○	○	○	○	البنك الذي أعمل له طور من اسلوبه في استخدام اصوله.	FP1
○	○	○	○	○	في البنك الذي أعمل له ارتفع صافي الدخل.	FP2
○	○	○	○	○	البنك الذي اعمل له زاد من مبيعاته.	FP3
○	○	○	○	○	البنك الذي اعمل له زاد من قيمته السوقية.	FP4
○	○	○	○	○	البنك الذي أعمل له، حسن لدينا عمليات مراقبة الجودة.	IBPP1
○	○	○	○	○	في البنك الذي اعمل له، تحسنت عمليات تقديم الخدمات / المنتجات.	IBPP2
○	○	○	○	○	البنك الذي اعمل له، وضع سياسات وإجراءات لزيادة رضا العملاء.	IBPP3
○	○	○	○	○	البنك الذي أعمل له، يتبع بشكل مستمر بروتوكولات جودة الخدمة / المنتج	IBPP4
○	○	○	○	○	البنك الذي اعمل له، حسن الخدمات / المنتجات التي يقدمها.	CRP1
○	○	○	○	○	في البنك الذي أعمل له، ارتفع عدد الأشخاص الذين يستخدمون خدماته ومنتجاته.	CRP2
○	○	○	○	○	في البنك الذي أعمل له، ازداد الطلب على خدماته / منتجاته.	CRP3
○	○	○	○	○	البنك الذي أعمل له، يقدم خدمات / منتجات مبتكرة وفريدة من نوعها في كثير من الأحيان أفضل من منافسينا.	CRP4
○	○	○	○	○	في البنك الذي أعمل له، الفترة الزمنية لبحث وتطوير الخدمات/ المنتجات أفضل مقارنة بمنافسينا.	CRP5
○	○	○	○	○	أتلقى معلومات كافية لأداء وظيفتي في البنك.	LGP1
○	○	○	○	○	لدي ما يكفي من المعلومات لاتخاذ القرارات المثلى لتحقيق أهدافي في الاداء.	LGP2
○	○	○	○	○	البنك الذي أعمل له، يوفر التدريب الذي أحتاجه لتلبية متطلبات وظيفتي.	LGP3

					البنك الذي أعمل له، يوفر التدريب المرتبط بأهدافه.	LGP4
○	○	○	○	○		