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Managing organizational learning ambidexterity: An exploratory study of Australian large service organizations

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USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

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    i.   incorporate without acknowledgment any material previously submitted for a degree or diploma in any institution of higher education;

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Agung NLI Fahrudi
15 June 2018

Abstract

Organizational ambidexterity is about developing necessary organizational capabilities to compete in new and changing markets that enable organizations to survive in the face of dynamic external environments. It is about finding a balance between exploring new knowledge and exploiting existing knowledge or capabilities. The research on ambidexterity has offered different mechanisms for pursuing ambidexterity, and has highlighted the pivotal role of organizations' senior teams and leadership behaviors in balancing the conflicting demands of exploration and exploitation. Research has also shown that no universal best practices should be sought to resolve the dilemma but instead leaders need to understand the situational context to enable them to develop the capability to effectively adjust the internal context of their organizations to the demands of the dynamic external environment or context. However, exactly how these leaders actually manage the interfaces of exploration and exploitation and the inevitable conflicts that arise from these two conflicting activities in practice is less clear. This study tries to address this gap by using an organizational learning lens to investigate what leaders actually do to achieve ambidexterity.

Research has shown that in terms of responding to the effects of the external context or environment, leaders need to pursue both cost-leadership (exploitation) and differentiation (exploration) strategies simultaneously to enable their organizations to compete competitively; they need to avoid "a stuck in the middle strategy" where they fail to successfully pursue either strategy. The aims of this thesis are thus twofold. The first aim is to examine the impact of external environments or contexts (i.e., competition, customer demands, development of technology, strategic partners, and government) on exploratory and exploitative innovation that organizations pursue. The second aim of this thesis, using Crossan et al.'s (1999) 4I framework, is to investigate how leaders facilitate organizational learning ambidexterity for the innovation they are pursuing. Leaders need to provide internal contextual support (i.e. strategy, structure, organizational culture, and resources) to facilitate learning in each of 4I phases in order to pursue innovation. Exploration of new knowledge (idea generation) is often associated with the intuition and interpretation phases of the 4I organizational learning process. Conversely, exploitation of existing knowledge (implementation) is closely linked to the process of institutionalization. One of the most challenging phases of the 4I framework is in the integrating phase, which requires trade-offs, particularly in resource allocation with individuals or groups often competing for scarce resources to explore and exploit.

A qualitative approach was adopted to address the research aims of this study. Case studies of four large Australian service organizations were undertaken in an exploratory analysis of the complex phenomenon of ambidexterity for innovation to account for contextual differences. The reason for choosing large service organizations is that service organizations need to

continuously explore new approaches to provide better service to their customers, but being large, these organizations often find it difficult to pursue innovation due to the complexity of their structures and bureaucracies. The service organizations studied are a regional private bank, a public university, a police academy, and a private hospital (having public-private partnership arrangements). These organizations had or are engaged in innovation. For the purpose of this study, innovation does not refer only to new services or practices in the industry but can also refer to something new to the organization being observed. Semi-structured interviews were conducted with 29 organizational members from the four organizations, mostly from the top and middle managerial levels due to the significant importance of the leadership role in ambidextrous organizations. The interviews were complemented by the use of documentary sources, such as the organizations' official websites, annual reports, and press releases. Interview data was classified thematically based on the predetermined framework of factors in the external and internal contexts and compared to the corresponding documentary sources to build interpretation for the within and cross-case analyses. The semi-structured interviews also allowed for any new or emerging themes to be considered.

Findings emerging from this research indicate that a resource-constrained environment has compelled the four service organizations to achieve increased efficiency, which is often associated with process innovation or exploitation. This was a common theme across the organizations despite their different contexts. Interestingly, for the researched organizations, exploration in a resource-constrained environment can also relate to significant or radical process improvements to increase efficiency and therefore exploration is not simply about developing new products or services. For example, the researched organizations strived to achieve higher efficiency by pursuing radical technological-based innovation and adopting administrative innovation i.e. structural reform. Nevertheless, the cases revealed that while these organizations strived to pursue both cost-leadership (efficiency) and differentiation strategies simultaneously, they tended to focus on efficiency (exploitation) rather than on product differentiation (exploration) in the face of a resource–constrained environment. However, the relative optimal level of or balance between exploration and exploitation varied between these organizations due to their contextual differences. The tendency of focusing on cost-leadership or efficiency was higher among the public organizations (e.g. the public university) compared to their private counterparts (e.g. the regional private bank). Conversely, the competitive pressure for product innovation or differentiation was higher in private than public organizations.

This thesis contributes to the discussion on organizational ambidexterity by demonstrating how the external context affects what leaders actually do to provide internal contextual support in order to facilitate organizational learning for both exploratory and exploitative innovation and thus achieve ambidexterity. It demonstrates that leaders should use the framework proposed in

this study to consider their organization-specific contexts in managing ambidexterity for innovation because the combinations of and interplay between external and internal contexts vary among different organizations.

Acknowledgement

All praise and utmost gratitude are due to Allah, the Most Merciful, for the blessings that I could finally complete my thesis despite all difficulties in life that made me want to give up. Hanging on my hope in God gave me strength to keep going and reach my goal in the journey.

List of Figures

List of Tables

Table of Contents

Chapter 1: Introduction

1.1 Background

Organizations need to balance exploration of new knowledge and exploitation of existing knowledge (termed as ambidexterity) to enable them to innovate and survive in changing environments (March, 1991; Raisch & Birkinshaw, 2008). Managing ambidexterity is a dynamic task requiring different solutions over time depending on the external and internal context (Raisch, Birkinshaw, Probst, & Tushman, 2009). While research on ambidexterity has highlighted the pivotal role of organizations' senior team and leadership behaviors in balancing exploration and exploitation, exactly how these leaders actually manage the interfaces of exploration and exploitation and the inevitable difficulties that arise from these two conflicting activities is less clear (O'Reilly III & Tushman, 2013). This study tries to answer this question by using an organizational learning lens to examine what leaders actually do to achieve ambidexterity. The 4I organizational learning framework (Crossan, Lane, & White, 1999) is used in this study to analyze how leaders manage organizational learning in terms of the tension between exploration and exploitation. This highlights the importance of leadership in influencing organizational learning (Berson, Nemanich, Waldman, Galvin, & Keller, 2006).

The 4I framework of intuiting, interpreting, integrating and institutionalizing (Crossan, et al., 1999) is extended to include the all-important elements of context in organizational learning for innovation. Leaders need to provide internal contextual support for learning to occur in the organization in order to pursue innovation in response to changes in the external context (Berson, et al., 2006). Leaders should be able to foster both exploratory and exploitative learning in the process of innovation and are expected to flexibly switch between them as required (Rosing, Frese, & Bausch, 2011). Research has shown that no universal best practices should be sought to resolve the dilemma of exploration and exploitation but instead leaders need to understand the situational context to enable them to develop the capability to effectively adjust the internal contexts of their organizations to demands of the dynamic external environment or context (Almahendra & Ambos, 2015; Benner & Tushman, 2015).

Leaders' perception of their business environment influences organizational learning orientations and innovation (Garcia-Morales, Llorens-Montes, & Verdu-Jover, 2006). Strategic leaders need to be able to apply appropriate leadership behaviors to pursue exploratory and exploitative innovation in dynamic environments (Jansen, Vera, & Crossan, 2009). External forces are often interrelated in influencing the pursuit of exploratory and exploitative

innovation. For instance, changes in customer and technical concerns affect the nature of competition which in turn influence the leaders' decisions to exploit existing competencies or explore new competencies (Floyd & Lane, 2000). In this study, the researcher examines external context in terms of competition (e.g. Desmet & Parente, 2010), customer demands (e.g. Godin & Lane, 2013), technology development (e.g. Danneels & Sethi, 2011), external strategic partners (e.g. Schamberger, Cleven, & Brettel, 2013), and regulatory environments (e.g. Patanakul & Pinto, 2014).

Not only do leaders need to be able to look outward to identify the external forces, they also need to be able to look inward to create an internal context for organizational learning that enables organizational members to respond to these external forces (H.-E. Lin & McDonough III, 2011). The internal context can influence the interaction between organizational members required for organizational learning by providing conditions that support or hinder this interaction (Argote & Miron-Spektor, 2011). The elements of the internal context examined in this study include strategy (e.g. Santos-Vijande, Lopez-Sanchez, & Trespalacios, 2012), structure (e.g. Raisch, 2008), organizational culture (e.g. C. L. Wang & Rafiq, 2014), and organizational resources (e.g. Jansen, Simsek, & Cao, 2012).

In this study, the researcher took an exploratory approach to investigate how leaders in Australian large service organizations provided contextual support for their members to pursue both exploratory and exploitative learning for innovation in different external and internal contexts. In Australia, about 21 per cent of total exports in 2016-17 were from services (Thirlwell, 2017). Service organizations need to continuously explore new approaches to provide better services to their customers (Che-Ha, Mavondo, & Mohd-Said, 2014). However, large organizations, including those in the service industry, often find it difficult to pursue exploration due to the complexity of their structures and bureaucracies (Eisenhardt, Furr, & Bingham, 2010; Vaccaro, Jansen, Van Den Bosch, & Volberda, 2012). In addition, Barrett (2016) states that lack of leadership for innovation and entrepreneurship has been a long-standing challenge for innovation in Australia. In this research, innovation does not have to be new services or practices in the industry but new to the organizations being investigated. Based on the level of change to an organization's existing knowledge, the researcher relates innovation to exploratory and exploitative activities. In this light, exploratory innovation is closely linked to radical changes whereas exploitative innovation is often associated with incremental changes (Jansen, Van Den Bosch, & Volberda, 2006). Using an organizational learning lens, the researcher examines how leaders facilitate organizational learning ambidexterity for innovation to respond to external challenges.

1.2   Research questions

By understanding the relative influence of both external and internal contexts, organizational leaders can take appropriate actions to adjust the relative balance between exploratory and exploitative learning to the changing environment in order to innovate and survive in changing environments. In this study, the main research question is:

How do organizational leaders facilitate organizational learning ambidexterity for innovation in order to respond to external challenges?

Subsidiary questions:

i.   How do external contexts (in terms of competition, customer demands, technology development, strategic partners, and regulatory environments) affect innovation?

ii. How do leaders facilitate exploratory and exploitative learning within the process of 4I organizational learning to pursue innovation?

To address these research questions, the researcher looked to the existing body of knowledge in related areas to help develop the conceptual theoretical framework for this study. An exploratory analysis of the complex phenomenon in four Australian large service organizations from different sectors was undertaken to account for contextual differences.

1.3   Contribution of the thesis

Different mechanisms for pursuing ambidexterity in organizations have been proposed but how leaders actually manage to achieve the relative balance between exploratory and exploitative learning has not been well documented. Ideally, organizations are supposed to be able to pursue high exploration and exploitation simultaneously. However, in fact, not every organization can achieve high exploratory learning and high exploitative learning at the same time. This exploratory study offers further insights into the nature of specific situational factors that drive organizational leaders in large service organizations to engage in both exploratory and exploitative innovation and how they pursue these two types of innovation through organizational learning.

This thesis contributes to both the research and practice communities in the area of organizational learning and innovation in large service organizations in the following ways:

1.   This study identifies potential enablers and barriers for the pursuit of exploration and exploitation simultaneously in Australian large service organizations. This study provides empirical evidence of how external and internal contexts can either encourage or discourage the simultaneous pursuit of exploration and exploitation. Organizations often need to focus on managing the trade-off between exploration and exploitation in a resource-constrained environment. While the study shows that the researched

organizations tend to pursue high exploitation during a resource-constrained period, the study also demonstrates what organizational leaders actually do to promote exploration in this type of environment in order to achieve ambidexterity.

2. This study offers further insights into how organizational leaders use different approaches to ambidexterity simultaneously and provides a better understanding of how contextual and structural ambidexterity can be complementary. The study demonstrates that the researched organizations adopted contextual ambidexterity through the implementation of human resource practices that encourage individuals to pursue both exploratory and exploitative learning. However, the adoption of a contextual approach alone is not adequate to promote exploratory innovation and thus the use of the structural approach is also required.

3. This study also offers a better understanding of the innovation process through an extension of the 4I organizational learning lens to include the effects of the elements of the external and internal contexts of an organization on organizational learning for innovation. The study provides empirical evidence of how external forces may drive organizations to pursue innovation and how organizational leaders facilitate organizational learning for innovation by controlling or adjusting the internal context (comprising elements such as strategy, structure, organizational culture, and organizational resources).

The results of this study have been disseminated to the academic research community in workshops and refereed papers in conferences (see Appendix 1).

1.4 Layout of the thesis

Chapter 1 provides the research background, the research questions, and the contribution of this study. Following this chapter, **Chapter 2** contains the literature review that examines the linkage between organizational learning and innovation and the role of context in organizational learning for innovation. The researcher reviews how exploratory and exploitative learning in the process of organizational learning are influenced by the external and internal contexts. The knowledge synthesized from the literature provides the conceptual framework for the study.

Chapter 3 discusses the underlying philosophical perspectives influencing the research approach and demonstrates how the most suitable research method was selected to answer the research questions. A multiple case study research model is then presented. The chapter discusses the relevant procedures related to internal validity, construct validity, external validity, and reliability to enhance the rigor of case studies. The chapter also contains ethical considerations for conducting this study. Four Australian large service organizations from different sectors were selected as cases for an exploratory analysis of the complex phenomena of organizational learning ambidexterity for innovation to account for contextual differences.

The chapter continues with a description of data collection and data analysis used in this research.

The four individual cases are discussed in separate chapters where a within-case analysis was carried out in order to map the proposed framework to the context of each individual organization. The findings from Case 1 are presented in **Chapter 4**. The first case provides insights about the external and internal context influencing organizational learning for innovation in a private regional bank. **Chapter 5** presents the result from Case 2 which discusses the context of a public university. The findings from Case 3 which is a police academy are presented in **Chapter 6**. A within-case analysis is again repeated for Case 4 which is a private hospital and the findings are discussed in **Chapter 7**.

Chapter 8 contains a cross-case analysis in which some of the major findings across the four cases are discussed collectively and related back to the research questions. In this chapter, the researcher proposes that organizations tend to focus on efficiency (exploitation) rather than on product differentiation (exploration) in a resource-constrained environment. This confirms the previous literature suggesting that resource-constrained organizations need to manage the trade-off between exploration and exploitation (Q. Cao, Gedajlovic, & Zhang, 2009; Gupta, Smith, & Shalley, 2006; March, 1991). However, interestingly, for the researched organizations exploration could mean radical process improvements aimed at increasing efficiency and not exclusively related to new product innovations. The optimal relative level of exploration and exploitation may depend on organizational leaders' capabilities in managing organizational resources. This chapter also discusses how leaders in the researched organizations affected strategy, structure, organizational culture, and organizational resources to facilitate organizational learning ambidexterity for innovation in order to survive in the resource-constrained environment. Finally, contributions to theory and practice that are derived from the research are presented and an acknowledgement of limitations of the study and recommendations for future research are discussed in **Chapter 9**. The layout of the thesis is presented graphically as shown in Figure 1.1 below:

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│                  Chapter 2 Literature Review                 │
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│            Chapter 3 Research Philosophy and                 │
│                      Methodology                             │
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              │ Chapter 9 Contributions,         │
              │ limitations & future directions  │
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Figure 1.1: Thesis Layout

Chapter 2: Literature Review

2.1 Introduction

Innovation has increasingly been recognized as a critical source of competitive advantage. Many researchers suggest that an organization needs to both explore new knowledge and exploit its existing knowledge to innovate and survive in changing environments (e.g. Gupta, et al., 2006; March, 1991; Raisch & Birkinshaw, 2008). It follows that organizations must balance the depth (how frequently an organization exploits or reuses its existing knowledge) and the scope (how widely an organization explores new knowledge) of its search for innovative solutions (Katila & Ahuja, 2002). Whereas exploiting existing knowledge can enhance an organization's core capabilities, it may confine the organization's competence to a particular area that no longer fits its dynamic business requirements (Leonard-Barton, 1992). Conversely, exploring new knowledge could mean that the organization will continue searching but may fail to gain potential benefits from its existing knowledge (Gupta, et al., 2006). Thus, ideally, organizations need to pursue exploratory and exploitative learning simultaneously (ambidexterity) to enable them to both compete in existing markets and to develop the required new capabilities to compete in new markets and use new technologies in order to survive in ever changing and dynamic business environments (O'Reilly III & Tushman, 2013; Raisch & Birkinshaw, 2008).

Although different mechanisms for pursuing ambidexterity in an organization have been proposed, how leaders actually manage the interfaces between exploration and exploitation has not been well documented (O'Reilly III & Tushman, 2013). Managing for ambidexterity is a dynamic task to align exploration and exploitation. It requires different solutions depending on the external and internal context of an organization (Raisch, et al., 2009). An organization can have high exploitative learning and high exploratory learning, higher exploitative learning coupled with lower exploratory learning, or lower exploitative learning complemented with higher exploratory learning in order to achieve the appropriate balance between exploitation and exploration (Wei, Yi, & Guo, 2014). Research on ambidexterity abounds in the literature since the concept was defined by Tushman and O'Reilly (1996, p. 24) as "The ability to simultaneously pursue both incremental and discontinuous innovation…from hosting multiple contradictory structures, processes, and cultures within the same firm". Themes such as organizational learning ambidexterity (Wei, et al., 2014), ambidextrous strategic leaders (Jansen, Vera, et al., 2009), ambidexterity mechanisms (Turner, Swart, & Maylor, 2013) have been researched and many empirical studies have been undertaken. However, more research is still required to examine the role of context for pursuing the appropriate balance between exploration and exploitation. Moroz and Hindle (2012) essentially stress the importance of

context in examining the entrepreneurial and innovation process. In addition, it is equally important to examine the role of leadership in supporting the different types of learning for ambidexterity (e.g. Berson, et al., 2006; O'Reilly III & Tushman, 2013; Rosing, et al., 2011). In the context where the business environment has dramatically changed in the last decade, some of the assumptions and past research findings about leadership and ambidexterity may no longer be relevant (Benner & Tushman, 2015) and thus more empirical research is required.

Research on innovation tends to focus on manufacturing companies and not enough attention has been given to service organizations (Carlborg, Kindstrom, & Kowalkowski, 2013; Storey, Cankurtaran, Papastathopoulou, & Hultink, 2016). While Geerts, Blindenbach-Driessen and Gemmel's (2010) quantitative longitudinal study on ambidexterity found that service firms preferred sequential ambidexterity (not simultaneously pursuing both explorative and exploitative learning or innovation), more research is needed to determine if this is still valid and exactly how the pursuit of ambidexterity in service organizations is influenced by their external environment and how their leaders respond to the external environment or context. More research on this topic is needed as service organizations significantly contribute to national economies (Aas & Pedersen, 2010). In addition, Che-Ha et al. (2014) argue that the nature of the service industry, with its intense customer participation in service co-production, requires organizations to continuously explore new approaches to provide better service to their customers. While larger organizations, including those in the service industry, are more likely to be innovative because they tend to have more resources allocated for innovation and can benefit from economies of scale in exploring new opportunities (Desmet & Parente, 2010; Hashi & Stojcic, 2013), some still find it difficult to pursue exploratory innovation (Hashi & Stojcic, 2013) as their complex structures and bureaucracies lead them to exploit existing knowledge (Eisenhardt, et al., 2010; Vaccaro, et al., 2012).

The focus of this research is on large organizations in the service industry, with a large organization being defined as an organization which has more than 49 employees and assets of at least AUD12.5 million at the end of a financial year (Australian Securities & Investments Commision, 2016). In this study, the researcher seeks to comprehend how leaders of four Australian large service organizations provide internal contextual support for their members to pursue both exploratory and exploitative learning based on their specific external and internal contexts.

In this chapter, the researcher reviews the existing literature in the field of innovation and organizational learning that is available from peer-reviewed journal articles. The selection of literature was not restricted by the date of publication.

This chapter is structured as follows:

In section 2.2 the researcher presents an overview of the innovation literature, including the definition of innovation, types of innovation, and processes of innovation.

In section 2.3 the researcher provides an outline of organizational learning ambidexterity, and the underlying process of exploratory and exploitative learning.

In section 2.4 the researcher reviews exploratory and exploitative learning, the key concepts in this thesis, and how these are influenced by organizations' contexts.

In section 2.5 the researcher discusses the linkage between organizational learning and innovation within the contexts discussed in section 2.4.

In section 2.6 the researcher provides a conclusion to the chapter and outlines the conceptual framework used in this study based on the review of the existing literature.

2.2 Innovation

In the following sections, the researcher establishes the boundaries of innovation being investigated in this research and also describes the types of innovation and processes of innovation.

2.2.1 Definition of innovation

While there are several definitions of innovation, the researcher has selected the following as being the most encompassing:

> Innovation is: production or adoption, assimilation, and exploitation of a value-added novelty in economic social spheres; renewal and enlargement of products, services, and markets; development of new methods of production; and establishment of new management systems. It is both a process and an outcome (Crossan & Apaydin, 2010, p. 1155).

> The implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations (OECD, 2005, p. 46).

Both definitions are similar in some ways. First, they both view innovation as more than a creative process, and both definitions include the implementation of innovation. Second, although a solution may already be available in the market, it can still be considered as an innovation if it is new to the firm. Lastly, both definitions of innovation go beyond the boundary of product and process innovation.

Unlike the OECD definition, Crossan and Apaydin (2010) explicitly view innovation as a process that answers the question 'how'. Viewing innovation as a process draws attention to how the process of innovation develops over time within an organization (Van de Ven &

Rogers, 1988). The definition by Crossan and Apaydin (2010) is more comprehensive and as such, this definition will be used in this research because it explicitly draws on the role of innovation as a process, rather than just an outcome. In the next section, the types of innovation will be discussed.

2.2.2   Types of innovation

Following previous studies, innovation can be classified into exploratory and exploitative innovation based on the level of change to an organization's existing knowledge (Benner & Tushman, 2003; He & Wong, 2004; Jansen, et al., 2006). Jansen et al. (2006) define exploratory innovation as radical changes to existing products or services to meet the needs of new customers or markets using new channel distributions or new technologies. Exploitative innovation, on the other hand, is described as involving incremental changes to existing products or services to satisfy existing customers, and/or incremental improvements to existing processes and distribution channels. According to March (1991), exploratory innovation can be associated with the search of entirely new knowledge, whereas exploitative innovation is linked to the refinement of existing knowledge.

In terms of changes to the end products (including services) and the processes in producing them, some researchers differentiate between product innovation and process innovation (Crossan & Apaydin, 2010; Rowley, Baregheh, & Sambrook, 2011). Product innovation is commonly associated with new radical product discovery or exploratory learning whereas process innovation is often associated with the refinement of existing processes or exploitative learning (March, 1991; Utterback & Abernathy, 1975). However, some process innovations can also have radical changes that may involve greater exploratory learning (Davenport, 1993). The introduction of new products or services can potentially yield greater incomes, and the improvement of production processes can result in increased efficiency (Fagerberg, 2005). Interestingly, research on innovation is dominated by product innovation, with less attention given to process innovation (Crossan & Apaydin, 2010).

Gopalakrishnan and Damanpour (1997) distinguish other types of innovation: technical and administrative innovation. They argue that technical innovation changes an organization's core productive system, including products, processes, and technologies used to produce products or render services. In contrast, administrative innovation changes an organization's management system, pertaining to organizational structure, administrative processes, and human resources (Gopalakrishnan & Damanpour, 1997). In this sense, these types of innovation require different sets of knowledge and skills. Technical and administrative innovation are complementary; technical innovation may require administrative innovation, and conversely administrative innovation may stimulate technical innovation (Ganter & Hecker, 2013; Van de Ven, Poolley, Garud, & Venkatraman, 2008). Bloch (2007) argues that administrative innovation has an

important role in product or process innovations, especially in service organizations, because work procedures and practices are often changed as consequences of changes in services. However, administrative innovation is still under-researched (Keupp, Palmie, & Grassmann, 2012). In this study therefore, the researcher examines some aspects of administrative innovation that enable the organizations in the study to engage in technical innovation and conversely, how technology impacts administrative innovation. In the next section, the researcher examines the processes of innovation.

2.2.3 Processes of innovation

Five models have been illustrated to explain the innovation processes: the technology-push model, the need-pull model, the coupling model, the integrated model, and the system and network model (Rothwell, 1992). The technology-push model emphasizes the role of research and development (R&D) in seeking new knowledge for innovation, while the need-pull model is focused on creating innovation based on learning about customers' demands. The coupling model combines the knowledge of customers' demands and available technology to create a new innovation. The integrated model emphasizes cross-functional integration within an organization and also external integration with suppliers and strategic partners in delivering innovative offerings. The system integration and networking model is a fully integrated model that emphasizes corporate flexibility and efficiency to speed up new product development using advanced information technology (IT) (Rothwell, 1992).

While Rothwell's (1992) model can offer useful insights for understanding the process of innovation, these models cannot fully explain the variety in innovation processes. A variety of innovation processes can be found across and within different industrial sectors, among firms within the same industrial sector, and also within the same organization over time (Hobday, 2005). The variety of innovation processes supports the notion of path dependence in which different organizations take different paths that are very specific or unique. The processes of innovation are thus contingent on internal as well as external factors (Perello-Marin, Marin-Garcia, & Marcos-Cuevas, 2013). In this study, the researcher thus argues for more research to better understand how both internal and external factors affect innovation processes in organizations.

Early studies of innovation used to assume innovation as a random process because these studies often emphasized too much the environmental factors that contribute to uncertainty in the process of innovation (Van de Ven, et al., 2008). However, an organization's capability to innovate is also determined by organizational factors that include the organization's specific resources and knowledge assets (Teece, Pisano, & Shuen, 1997). This organizational capability can be developed through learning (Zollo & Winter, 2002). Essentially, organizational learning can result in both incremental and radical innovation (McKee, 1992). Therefore, both

exploitative and exploratory learning are relevant for understanding the process of innovation (March, 1991).

From the learning perspective, the innovation process involves idea generation (or creativity) and idea implementation which are associated with two different but complementing learning activities, i.e. exploration and exploitation (Rosing, et al., 2011). In the initiation or idea generation phase of the innovation process, March (1991) argues that idea development requires variation and experimentation and is linked more closely to exploratory learning. Exploration involves significant amounts of new learning (Gupta, et al., 2006). However, exploration of new ideas during the initiation phase also requires exploitation of existing knowledge as the ability to learn new knowledge is determined by previous learning which enables the linking between the new and existing knowledge (Cohen & Levinthal, 1990). Thus in the initiation or idea generation stage, both exploratory and exploitative learning occur. Rosing et al. (2011) argue that leaders need to stimulate their followers to think "outside of the box" in this phase to promote more exploratory ideas. McKee (1992) states that exploratory innovation requires greater product-innovation learning that can be linked to exploratory learning.

When organizational members engage in greater exploitative learning in the initiation phase, they will be more likely to produce exploitative innovation. According to Gupta et al. (2006), exploitation involves the refinement or extension of existing knowledge and a little new knowledge. They argue that there is always some new learning in all activities even if it is relatively little because "there is no such thing as perfect replication" in social systems (2006, p. 694). In other words, the exploitation of existing knowledge also includes at least some exploration of new knowledge. Thus, organizational members tend to pursue higher exploitative learning coupled with lower exploratory learning in the initiation phase of an exploitative innovation process.

According to March (1991) implementation of ideas requires efficiency and routine execution. However, the exploitation of existing knowledge also needs the exploration of new knowledge in the idea implementation phase to manage unexpected outcomes or events, such as resistance to change (Rosing, et al., 2011). As such, both exploratory and exploitative innovations require high exploitative learning and low exploratory learning in the implementation stage. Nevertheless, overall there is a higher extent of exploratory learning in exploratory innovation than exploitative innovation, and more exploitative learning than exploratory learning in exploitative innovation (Gupta, et al., 2006).

While Rosing et al.'s (2011) framework is useful for understanding ambidexterity in a general innovation process of exploring new ideas and implementing them, it does not explain how an organization manages both its exploratory and exploitative learning for innovation

simultaneously. In the next section, the researcher discusses how an organization may achieve organizational learning ambidexterity.

2.3 Organizational learning ambidexterity

Literature suggests that the three major, high level mechanisms to balance exploration and exploitation are temporal (or sequential), structural, and contextual ambidexterity (Turner, et al., 2013), as shown in Table 2.1.:

Mechanisms	Description	Modes
Temporal	Organizations pursue short bursts of exploration followed by long periods of exploitation.	Sequential
Structural	Organizations have physically separated organizational units focusing on exploration from those focusing on exploitation.	Simultaneous
Contextual	Organizations design business unit contexts that enable every organizational member to pursue both exploration and exploitation activities.	Simultaneous

Table 2.1. High level mechanisms to balance exploration and exploitation (adapted from Turner, et al., 2013)

Tushman and O'Reilly (1996) argue that an organization tends to focus on high exploratory learning when it faces environmental shifts or revolutionary changes. On the other hand, an organization tends to pursue high exploitative learning during periods of incremental or evolutionary change. Burgelman (2002) proposes that an organization pursues short bursts of exploration followed by long periods of exploitation. For example, technological cycles can lead to a periodic need for discontinuous or punctuated change (Tushman & O'Reilly III, 1996). Firms pursue high exploratory learning to introduce a new product or service using emerging technologies that challenge existing products or services using established technology. When the new products or services gain wide customer acceptance, these firms shift to high exploitative learning to achieve higher efficiency and incremental improvements through the pursuit of process innovation. In this way, organizations may pursue exploration and exploitation in temporal or sequential fashion.

Nevertheless, Gilbert (2006) proposes that many organizations operate in multiple environments requiring them to exploit their core knowledge in an existing market and at the same time explore opportunities in a new market. For instance, a newspaper organization may use separate subunits to explore the digital publishing market while simultaneously using other subunits to exploit existing paper-based markets. This suggests that temporal ambidexterity is not applicable in such situations where organizations have to pursue both exploration and exploitation simultaneously (Turner, et al., 2013). Organizations can achieve the simultaneous

pursuit of exploration and exploitation through structural ambidexterity (Tushman & O'Reilly III, 1996) and/or contextual ambidexterity (Birkinshaw & Gibson, 2004).

Structural ambidexterity physically separates organizational units focusing on exploratory learning (i.e. R&D) from those focusing on exploitative learning (Tushman & O'Reilly III, 1996). Having a separate organizational subunit that has a specific task to innovate can help the organization explore new alternatives by lessening its probability of prematurely converging on a suboptimal solution due to conformity to the prevailing organizational norms and wisdom (Benner & Tushman, 2003; Fang, Lee, & Schilling, 2010). Exploration units have flexible and adaptive structures to enable the exploration of new areas for growth, while exploitation units have more formal and mechanistic structures to ensure efficient operations in existing business routines (Raisch, 2008). The separation of exploratory and exploitative units ensures resource allocation for both exploratory and exploitative activities (O'Reilly III & Tushman, 2011). However, these separate organizational units need to be integrated to leverage common resources across units and achieve organizational effectiveness (O'Reilly III & Tushman, 2011; Raisch, et al., 2009). The integration of these separate units can be done at the senior team level (Benner & Tushman, 2003) as leaders have the most complete understanding of the organizational strategic context and they are consequently better able to evaluate the organization's exploratory and exploitative initiatives (Floyd & Lane, 2000). However, some scholars also suggest that lower-level integration approaches are required to encourage the lateral knowledge flow across units (Gilbert, 2006; Raisch, 2008; Raisch, et al., 2009). In addition, since exploratory units tend to work in isolation, these units need to be integrated with the core business as quickly as possible in order to achieve the organization's objectives (Birkinshaw & Gibson, 2004). In order to do so, the integration of exploratory and exploitative learning can take place at the individual employee level to minimize the coordination problems between exploration and exploitation (Birkinshaw & Gibson, 2004; Kang & Snell, 2009).

Research on ambidexterity further highlights that exploration and exploitation are interdependent and complementary and cannot be easily separated (Farjoun, 2010; Turner, et al., 2013). For example, Farjoun (2010, p. 218) argues that "individuals engaged in routine tasks exercise some degree of experimentation, and those engaged in creative tasks use routines to some degree". Birkinshaw and Gibson (2004) propose a concept of contextual ambidexterity in which an organization designs business unit contexts that enable every individual in the organization to pursue both exploitation and exploration activities. They argue that a configuration of stretch, discipline, support, and trust can create a context that promotes contextual ambidexterity, i.e., relative flexibility in pursuing both exploratory and exploitative learning, enabling individuals to make their own judgments how to best divide their time between these two activities. In this way, individuals will be able to use or refine existing knowledge and explore new knowledge as required by the task environment. Contextual

ambidexterity can also be a function of an organizational culture that supports individual flexibility (Khazanchi, Lewis, & Boyer, 2007). However, O'Reilly III and Tushman (2013) are of the opinion that contextual ambidexterity would not easily lend itself to an environment of disruptive or discontinuous changes in markets or technology, where it will be senior management and not individual organization members who will need to make decisions about structures and resources. Furthermore, separate units for exploration and exploitation are still required to provide space and resource for a new initiative to get started. Therefore, structural ambidexterity and contextual ambidexterity could be considered complementary in reconciling the tension between exploration and exploitation activities (Birkinshaw & Gibson, 2004). While structural ambidexterity tends to focus on differentiation, contextual ambidexterity is more likely to emphasize integration. The relative balance between differentiation and integration tends to vary with the specific task at hand (Raisch, et al., 2009).

Nevertheless, Almahendra and Ambos (2015) argue that none of the above mechanisms (temporal, structural or contextual ambidexterity) is inherently superior and as such managers need to understand the situational contexts and develop capability to effectively adjust the internal context to the demands of the dynamic external environment. In this study, the researcher uses Crossan et al.'s (1999) 4I organizational learning categorization to examine how organizations manage ambidexterity and tries to identify specific situational factors that influence organizational ambidexterity. The underlying tension between exploratory (feed-forward) and exploitative (feed-back) learning in the 4I organizational learning model is caused by "a gap between what an organization needs to do and what it has learned to do" (Crossan, et al., 1999, p. 530). Established routines and procedures tend to prevent organizations from pursuing exploratory learning (Lengnick-Hall & Inocencio-Gray, 2013). The embedded knowledge limits the organization's ability to recognize the value of unfamiliar learning and in turn contributes to the organization's inertia (Levinthal & March, 1993). In this sense, organizations tend to exploit what they have understood because the outcomes are more predictable and visible in the short run (March, 1991). In addition, as organizations increase in size and age, they tend to have more complex structures and routines, which in turn pull these organizations towards exploitative learning (Eisenhardt, et al., 2010). This exploitative learning may lead to the development of the organization's competencies that no longer fit the current business requirements (Leonard-Barton, 1992). To understand the tension between exploration and exploitation and the mechanisms for achieving the balance between these two activities using an organizational learning lens, the process of organizational learning (in terms of exploratory and exploitative learning) will be examined in the following section.

2.3.1 Processes of organizational learning

In this study the researcher adopts the 4I framework of Crossan et al. (1999) because it is suitable for understanding the underlying tension between exploratory learning and exploitative learning from a process perspective. The framework also links individual, group, and organizational levels, providing mechanisms to explain how learning processes at an individual-level aggregate up to the organizational level (Crossan, et al., 1999). In responding to Gupta et al.'s (2007) call for the need for more research in studying innovation through a multilevel approach, the framework can offer insights for understanding how the innovation phenomena in the organization emerge from the interactions and exchanges among individuals and groups.

The 4I framework contains four related sub-processes: *intuiting*, *interpreting*, *integrating*, and *institutionalizing* (Crossan, et al., 1999). Intuiting focuses on an individual's thinking process of developing ideas, whereas interpreting focuses on understanding the process of meaning that enables individuals to communicate their ideas to their peers or group members. In this sense, intuiting and interpreting refer to the process of how ideas are developed and shared. Ideas may come from individuals or from discussions among a group of organization members. Once a shared understanding related to the ideas within a group is achieved, the process of integration occurs. Finally, the ideas that have been learned are institutionalized by embedding this learning in the institution-wide organizational systems, structures, strategy, routines, and infrastructures. These sequences from intuition to institutionalization are called "feed-forward" or exploratory learning. The institutionalized learning in turn feeds back from the organization to the group and individual levels, creating a context that affects how people behave and think. This "feedback" or exploitative learning enables organizations to exploit the institutionalized learning (Crossan, et al., 1999).

The exploration of new knowledge emphasizes the intuiting and interpreting phases of 4I organizational learning (Berson, et al., 2006). During the intuiting and interpreting phases, individuals and groups share and develop new ideas which may then crystallize into more concrete initiatives (Crossan, et al., 1999). Leaders need to provide internal contextual support that can stimulate organizational members' creativity and sharing of knowledge to develop new initiatives during these phases (Berson, et al., 2006). Research on factors that affect individuals' and teams' creativity are useful for understanding how new knowledge for innovation is created (Argote & Miron-Spektor, 2011). For instance, creativity or new idea generation can be influenced by leadership (Gumusluoglu & Ilsev, 2009; Hunter & Cushenbery, 2011; Rosing, et al., 2011), experience (Gino, Argote, Miron-Spektor, & Todorova, 2010), vision (Sarros, Cooper, & Santora, 2008), organizational routines (Feldman & Pentland, 2003), personal characteristics of innovator (Miron-Spektor, Erez, & Naveh, 2011), motivation (Uthman, 1997), social networks (Rothaermel & Hess, 2007), ICT (Information and Communication

Technology) tools (Kane & Alavi, 2007), incentives (Ederer & Manso, 2013; Manso, 2011), corporate culture (Rao & Weintraub, 2013; Tellis, Prabhu, & Chandy, 2009), external innovation partners (Schamberger, et al., 2013), and physical environment (Oksanen & Stahle, 2013).

In the intuiting phase, individuals develop new ideas or insights based on personal experience (Crossan, et al., 1999). Leaders need to encourage their members to think in new directions and allow them to challenge the established routines to promote a variety of new ideas (Rosing, et al., 2011). Schilling and Kluge (2009) identify four major groups of factors that can prevent the development of novel ideas: (a) bounded rationality and incomplete knowledge of organizational members in which individuals tend to search for solutions locally or choose solutions that are familiar to them, (b) the characteristics of knowledge that are implicit, ambiguous and/or from different cultural origin (i.e. from different countries) can impede its adaptation by organizational members, (c) bureaucratic restrictions and strictly limited roles that can discourage organizational members to come up with novel ideas, and (d) the fear of failure and blame can suppress new insights. As such, leaders need to provide internal contextual support that prevents or overcomes any of these factors in order to encourage individual members to develop new insights and ideas (Berson, et al., 2006). Leaders can develop organizational members' competences or expertise and motivate them to innovate through various human resource management practices, such as training and compensation (C.-H. Lin & Sanders, 2017). In addition, leaders can establish dedicated units for exploration (i.e. structural ambidexterity) to provide space and resources for a new initiative to get started (O'Reilly III & Tushman, 2011).

In the interpreting phase, individuals explain their ideas through words and/or actions to others and to groups in the organization (Crossan, et al., 1999). Members from different units tend to view the importance of knowledge differently because they have unique subcultures with different sets of values, norms, and practices (De Long & Fahey, 2000). Collective interpreting among these organizational members can provide multiple perspectives and generate enriched interpretations that are required for innovation (Crossan, et al., 1999). Leaders need to facilitate constructive dialogues among these members and groups in the organization to enable the creation of new knowledge (Nonaka, 1988). The acceptance of new ideas and insights is often impeded by aspects of interpersonal relationships in which perceived status, lack of trust, and conflicting relationships can affect the interpretation process negatively (Schilling & Kluge, 2009). The originator of the idea or the champions of the idea often need to have access to scarce resources, relevant expertise, and/or have cultural understanding in order to influence the acceptance of the idea in the interpretation process (Lawrence, Mauws, Dyck, & Kleysen, 2005). In addition, leaders need to provide a shared interpretation or mental model that facilitates the group process of interpretation by refocusing the learning of organizational

members on organizational goals that in some cases may not be readily compatible with existing individual needs and interpretations (Berson, et al., 2006).

In the integration phase, a shared understanding among individuals and groups needs to be achieved to allow for coherent and collective action within the organization (Crossan, et al., 1999). Leaders need to provide a common purpose and shared understanding to integrate learning at the group and organizational levels (Berson, et al., 2006). Leaders can facilitate teamwork or collaboration among organizational members to encourage them to work collectively to achieve the organization's goals (C.-H. Lin & Sanders, 2017). Schilling and Kluge (2009) identify three major groups of factors that prevent an organization-wide implementation of novel ideas: (a) the lack of motivation on the part of the innovative organizational unit, (b) the lack of top management support, and (c) active resistance from other organizational units towards the innovative ideas. As such, leaders at different levels of management need to guide the integration of new and existing learning to enable organization-wide implementation of innovative ideas (Berson, et al., 2006). The most difficult part of the integration process is in the areas requiring trade-offs, particularly in resource allocation, with individuals or groups often competing for scarce resources (Crossan & Berdrow, 2003). Individuals in different functions or managerial levels tend to have different knowledge, expectations, and priorities that may lead to conflict (Floyd & Lane, 2000). Vision and strategy can serve as a common goal and shared understanding to achieve integration of these differences (Hunter & Cushenbery, 2011). In addition, leaders can facilitate informal and formal meetings to promote convergence and agreement within and among groups (Boerner, Schaffner, & Gebert, 2012). Consistent conversation and dialogue among organizational members during these meetings can result in a shared understanding or integrated knowledge. Mutual adjustments to the required actions for innovation also need to be negotiated to gain greater acceptance and support from all organizational members (Crossan, et al., 1999). When integration is difficult to achieve, top leaders may use their power and authority to enable integration (Lawrence, et al., 2005).

In the integrating phase, leaders often face tension between exploration and exploitation activities (Berson, et al., 2006). In organizations with separate exploratory and exploitative units, the integration between exploratory and exploitative activities takes place at the senior management team level (Benner & Tushman, 2003). Having the most complete understanding of the organization's strategic context, senior leaders are able to evaluate innovation initiatives and make decisions around resource allocation (Floyd & Lane, 2000). In this way, leaders can streamline innovation initiatives and at the same time facilitate the integrating process. However, the ways leaders evaluate innovation initiatives and allocate resources for these initiatives are critical in the pursuit of exploration because organizations often find it difficult to value initiatives that deviate from their core competencies (Leonard-Barton, 1992). Therefore,

leaders or managers need to be able to balance exploration and exploitation activities (Mom, Van Den Bosch, & Volberda, 2009). Informal social integration among senior leadership team members can encourage them to openly discuss and debate conflicting demands of exploration and exploitation and in turn enable them to evaluate and reconfigure potential combinations of knowledge sources at separated exploratory and exploitative units (Jansen, Tempelaar, Van Den Bosch, & Volberda, 2009).

Nevertheless, the integration of separated units at senior management team level is not sufficient - lower-level integration mechanisms are also required to promote the lateral knowledge flow across units (Gilbert, 2006). Cross-functional interfaces (such as liaison personnel, task forces, and teams) can help the integration of exploratory and exploitative activities at the lower levels of management by enabling knowledge exchange across exploratory and exploitative units (Jansen, Tempelaar, et al., 2009). In addition, leaders also need to create an organizational culture that will enable members to simultaneously explore new competencies and exploit existing capabilities (H.-E. Lin & McDonough III, 2011). Each member needs to be able to explore new knowledge and exploit existing knowledge as required by the task environment (Birkinshaw & Gibson, 2004). For example, even organizational members that specialize in exploration (i.e. R&D teams) need to exploit to some degree so that they will not only search for new ideas but are also able to exploit potential benefits from their existing knowledge. As such, organizations need to adopt contextual approach to ambidexterity in order to facilitate integration at the individual level (Birkinshaw & Gibson, 2004).

Organizations may not only need to integrate new and existing knowledge across separated units but also from external sources. The involvement of external innovation partners may help organizations pursue exploration (Schamberger, et al., 2013). Organizations' abilities to integrate internal and external knowledge bases may rely on a combination of external brokerage and internal absorptive capacity (Raisch, et al., 2009). Whichever way the integration occurs, the learning outcomes of the integrating process become inputs for the institutionalizing process (Crossan, et al., 1999).

The process of institutionalization emphasizes the role of leadership in making knowledge available for exploitation (Berson, et al., 2006). In other words, institutionalization enables organizations to retain lessons learned and transfer these lessons or knowledge to all organization members, and thereby facilitate the exploitation of what they have already learned. Institutionalizing can include the implementation of changes in the organizational systems, structures, strategy, routines, and infrastructures (Crossan, et al., 1999). Four major groups of factors that prevent an organization-wide institutionalization and adoption of innovation are identified: (a) a lack of trust in the innovation itself, (b) insufficient skills and knowledge in adopting the innovation on the part of teams and employees, (c) inadequate management skills

in providing consistent and systematic implementation, and (d) the organizational units and members' counteractive and opportunistic behavior (Schilling & Kluge, 2009). As such, leaders at different levels of management need to guide the institutionalization of new and existing learning (Berson, et al., 2006).

The institutionalized knowledge may change the organization's contexts and the contexts in turn affect the organization's future learning, creating a self-reinforcing mechanism (Argote & Miron-Spektor, 2011; Crossan, et al., 1999). Lengnick-Hall and Innocencio-Gray (2013) argue that institutionalized learning can facilitate or hinder organizational learning for pursuing new innovation initiatives. For example, simple routines can facilitate organizational members to acquire new knowledge to carry out their jobs in a complex and dynamic working environment (i.e. less formal rules enable organizational members to experiment or take new approaches). On the other hand, standardized processes and detailed routines can impede new learning in a dynamic working environment but can encourage the use and refinement of existing knowledge in a stable and low-risk environment (Lengnick-Hall & Inocencio-Gray, 2013). When new learning becomes more embedded in organizational practices, it becomes very difficult to develop new initiatives that challenge the prevailing wisdom (Crossan & Berdrow, 2003). Therefore, leaders need to be able to institutionalize new learning in such a way that enables the organization to pursue exploration and exploitation simultaneously (Lengnick-Hall & Inocencio-Gray, 2013). Leaders should create an organization culture that is conducive for innovation and develop organizational capabilities to configure and reconfigure resources and operational routines to respond to a changing business environment (C.-H. Lin & Sanders, 2017). How leaders provide internal contextual support to facilitate 4I organizational learning for innovation (feed forward and feedback learning) as outlined above is summarized in Figure 2.1.
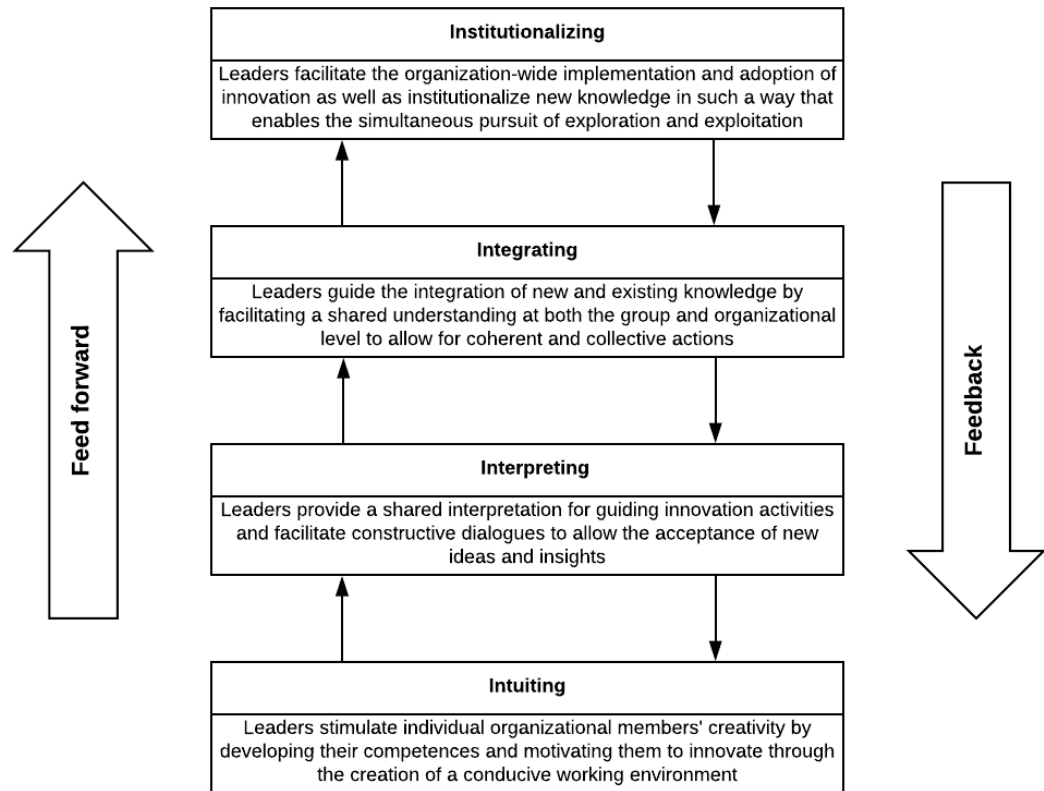
Figure 2.1: Internal contextual support for 4I organizational learning (adapted from Crossan et al. (1999), Berson et al. (2006), Schilling and Kluge (2009), and Lin and Sanders (2017))

In the service sector, organizations need to continuously learn evolving customers' demands (an element of the external context) and understand and adapt their capabilities internally (internal context) to enable them to provide better services to satisfy their customers (Che-Ha, et al., 2014). In this way, service organizations also encounter the tension of exploiting existing competencies and exploring new competencies with external and internal contexts affecting their organizational learning and pursuit of innovation. The nature of innovation phenomena is influenced by the setting or the organization's contexts where the innovation phenomena happen (Gupta, et al., 2007). In the next section, the organization's contexts will be explored.

2.4 Organization's contexts

According to Argote and Miron-Spektor (2011), organizational learning may change the organization's contexts, which in turn influences the organizations' future learning, creating a self-reinforcing mechanism. For example, strategy may influence organizational learning (Yeung, Lai, & Yee, 2007), but in turn organizational learning may also affect strategy (Crossan & Berdrow, 2003). The notion of organization's contexts in this study refers to both the external and internal contexts. By understanding the organization's contexts, the researcher proposes that organizational leaders will be able to facilitate organizational learning for innovation by adjusting the internal contexts as a response to external challenges. As mentioned by

Papastathopoulou and Hultink (2012), it is crucial for leaders to be aware of and manage the external and internal factors in developing new innovative offerings. In the following sections, the researcher discusses the external and internal contexts.

2.4.1 External contexts

External contexts include elements that are beyond the organization's boundary (Argote & Miron-Spektor, 2011). The decision makers' perception of external contexts influences organizational learning orientations and innovation (Y.-L. Wang & Ellinger, 2011; Weerawardena, O'Cass, & Julian, 2006). External forces are often interrelated in affecting the pursuit of exploratory and exploitative innovation. For example, changes in customer and technical concerns can influence the nature of competition which affects the leaders' decision to either deploy existing competencies (exploitation) or redefine new competencies (exploration) (Floyd & Lane, 2000). In this study, the researcher will examine external contexts in terms of competition, customer demands, technological development, strategic partners, and regulatory environment and how they affected the pursuit of innovation.

2.4.1.1 Competition

When operating in an industry that is less competitive, organizations may only need incremental (or exploitative) innovation rather than radical (or exploratory) innovation (Sirmon, Hitt, Ireland, & Gilbert, 2011). Larger firms in less competitive industries are able to benefit from economies of scales by spreading their fixed costs of R&D over a greater number of products which lead them to engage in process innovation to gain higher efficiencies (Desmet & Parente, 2010). Floyd and Lane (2000) argue that this type of competition is mainly influenced by product market (customer concerns) changes in which the core technologies underlying the product and production process remain relatively the same.

However, these organizations may not be able to maintain their competitive advantage in the long term by relying on exploitative innovation if competitive rivalry becomes very intense and creates significant uncertainty for all organizations involved (Sirmon, et al., 2011). These uncertainties arise as a result of technological change, variations in customer preferences, and fluctuations in product demand or supply of materials (Jansen, et al., 2006). Such uncertainties prompt organizations to redefine their existing competencies, leading to the exploration process (Floyd & Lane, 2000). In addition, as the environment becomes more uncertain, organizations need to introduce exploratory innovations that are significantly different from existing products, services, and markets (Jansen, et al., 2006). In this way, they compete by developing and deploying new competencies for exploratory innovation that potentially makes current products obsolete (Floyd & Lane, 2000). Therefore, while organizations may initially be more likely to pursue high exploitative innovation and low exploratory innovation in less complex

environments, they are more likely to pursue high exploratory innovation coupled with low exploitative innovation when the environment becomes highly competitive and uncertain. In this study, the researcher examines how rivalry actions from competitors affect the decisions of organizational leaders in pursuing exploratory or exploitative innovation and ambidexterity.

Firms need to understand their customers better in order to provide products or services that can meet customers' demands and in turn to stay competitive. In the next section, the researcher explores how customers' demands affect innovation.

2.4.1.2   Customer demands

Demand is recognized as one of the most significant determinants for innovation in accordance with the demand-pull model of innovation (Godin & Lane, 2013). Customers' demands may stimulate new innovation and conversely new innovation may influence customers' demands in the future (Saviotti & Pyka, 2013). Customers' needs also create opportunities for firms to introduce new products and services, which may change peoples' behaviors and in turn affect customers' demands. For example, the advancement of information technology (IT) has changed the way people do their banking activities (Berger, 2003) and influence people's expectation of banking services. As a result, customers' demands evolve as the environment changes (Saviotti & Pyka, 2013). As a consequence, firms must learn about customers' demands to enable them to provide products or services that can satisfy their customers better (Che-Ha, et al., 2014).

Compared to manufacturing companies, service firms tend to have more intense relationships with their customers in developing new services (Che-Ha, et al., 2014). Service firms require customer participation in service production and delivery to increase the levels of fit between service innovation and customers' demands (Ngo & O'Cass, 2013). Service firms also need to capitalize and pursue bottom-up learning that enable them to gather customers' information from their frontline employees who interact with customers directly (Ye, Marinova, & Singh, 2012). Customer input is generally valuable in the process of new product design but organizations need to be aware of how customer involvement may potentially affect their capabilities to pursue either exploitative or exploratory innovation (Menguc, Auh, & Yannopoulos, 2013).

Service organizations are more likely to pursue exploitative innovation when they are overly concerned with customers' inputs about the content of a potential new offering (Gustafsson, Kristensson, & Witell, 2012). Customers often find it difficult to suggest radical solutions because they make suggestions based on their experiences in using different products (Knudsen, 2007). In other words, customer input often results in small improvements of product newness (Callahan & Lasry, 2004). Incremental or exploitative product innovation capability is most

useful when customer needs are easy to be identified and organizations strive to meet those demands (Menguc, et al., 2013).

Customer input may be less useful in the case of radically new products (Menguc, et al., 2013). However, organizations need to better understand the match between latent (not clearly visible) customer needs and new innovative solutions to enable them to deliver successful radical or exploratory service innovation (Gustafsson, et al., 2012). To understand the match between latent customer needs and radical service innovation, customer involvement is still needed in the phase of idea generation, concept and early prototype testing (Melton & Hartline, 2015). As such, lead customers' inputs may be required in developing new products or services (Carbonell & Rodriguez-Escudero, 2014) and organizations tend to collaborate with customers who are knowledgeable and experienced (Greer & Lei, 2012).

In this study, the researcher examines how customers' demands influence exploratory and exploitative innovation. Since customers may require complex services that can be difficult to be developed using existing technology, firms may consider adopting new technology. In the next section, the researcher discusses the role of technology advancement in influencing innovation.

2.4.1.3 *Development of technology*

Due to the rapid development of technology, organizations need to continuously learn about emerging technologies and explore new ways of utilizing these technologies to develop new products or services (Danneels & Sethi, 2011) or to improve existing ones. Organizations often have to adopt new information systems or technologies to survive because competitors may also use this new technology to introduce new services that may eventually become necessities for doing business. For example, Westpac Bank was the first bank to introduce automated teller machines (ATMs) in 1981 in Australia. This initiative was gradually followed by its competitors (Roberts & Amit, 2003) and today ATMs are a feature of every bank in Australia.

Organizations may explore new ways of using existing and emerging technology to develop new products or services and to redesign their business processes. The adoption of new technology can result in the pursuit of product and process innovation. Desmet and Parente (2010) demonstrate that increased competition can encourage organizations to achieve higher efficiencies and in turn pursue process innovation which may involve the adoption of advanced technologies. While process innovation is usually associated with exploitative innovation to achieve higher efficiency (Fagerberg, 2005), some process innovations can involve significant changes and therefore can be considered as exploratory innovation (Davenport, 1993). Floyd and Lane (2000) argue that organizations need to redefine their existing competencies

(exploration) when the core technologies underlying the product and production process have changed significantly.

In this study, the researcher investigates how the development of technology affects exploratory and exploitative innovation in four large service organizations. While technological development may promote technological-based innovation, many organizations often find it difficult to seize this opportunity. Organizations may need to collaborate with external partners to deliver technological-based innovation. In the following section, the researcher investigates how external partners can affect innovation.

2.4.1.4   Suppliers and strategic partners

Schamberger et al. (2013) propose that organizations tend to collaborate with external innovation partners to access new supporting competencies, which are difficult or unable to be developed internally. Indeed, external learning through inter-organizational partnering has been found to enhance knowledge for innovation (Hashi & Stojcic, 2013; Kostopoulos, Papalexandris, Papachroni, & Ioannou, 2011; H.-E. Lin, McDonough III, Lin, & Lin, 2013). External innovation sources may include suppliers (Jean, Kim, & Sinkovics, 2012), universities (Janeiro, Proenca, & Goncalves, 2013), and independent experts (Schamberger, et al., 2013).

As most organizations cannot sustain technological excellence on their own, they need to collaborate with suppliers (Schamberger, et al., 2013). Suppliers can help organizations develop product and process innovation (Jean, et al., 2012). In fact, in a new radical product development, supplier participation in the product development is most useful when technology is unique and complex (Peterson, Handfield, & Ragatz, 2003). However, while suppliers can assist organizations to pursue exploratory innovation, they may also impede it. Suppliers may be reluctant to support organizations to develop a substantially new product because it may lead to major changes to their own investments in existing resources and skills (Lau, Tang, & Yam, 2010). In addition, organizations may face many challenges in developing common goals between them and their key suppliers, particularly in the pursuit of exploratory innovation (Schamberger, et al., 2013).

In pursuing radical or exploratory innovation, some organizations may also collaborate with universities (Janeiro, et al., 2013). In a study of biotechnology firms, George et al. (2002) show that linkages with universities can help these firms reduce their R&D expenses while achieving higher innovation outputs. However, aside from large universities of technology, many other universities have not been able to provide such assistance and may only be able to help organizations with the pursuit of incremental or exploitative innovation (Schamberger, et al., 2013). In addition, some collaboration between firms and universities often yield outcomes that

are too academic and are relatively difficult to be translated into commercial products (Schamberger, et al., 2013).

In addition to universities, organizations may also work with consultants to pursue innovation. Consultants not only can provide expert knowledge and facilitate the sharing of experience (i.e. acting like bees in cross-pollinating ideas between firms), they also help firms articulate and define their particular needs for innovation, and act as "marriage brokers" in pairing firms with needs and solutions (Bessant & Rush, 1995). These consultants can be very helpful in providing cutting-edge technological support and creating new knowledge; however they may not have a full understanding of a firm's existing internal knowledge base (Schamberger, et al., 2013).

In this study, the researcher explores the role played by external partners in the pursuit of exploratory and exploitative innovation in the four service organizations. These external partners may also assist these organizations in accessing new competencies to comply with the governmental regulations and standards. In the next section, the researcher examines the effects of the government and regulatory environment on innovation choices in organizations and the role that organizational learning plays in those choices.

2.4.1.5 *Government and regulatory environment*

While regulations affect innovation choices in industry, these impacts are not deterministic because of the uncertainty in both technology and the market (Firth & Mellor, 1999). Regulations on quality standards can stimulate firms to pursue quality improvements through innovation (Amable, Demmou, & Ledezma, 2009). Some regulations can also be used to assure safety and effectiveness of new technological innovation, such as medical devices (Curfman & Redberg, 2011). In addition, deregulations can affect competition which in turn may stimulate efficiency and productivity growth (Baily, Gordon, & Bresnahan, 1993). The increased competition will then be more likely to encourage innovation (Desmet & Parente, 2010). Regulation on competition aims to balance the need for rewarding innovators and preventing successful firms from blocking innovation from their rivals (Waller & Sag, 2015). While regulation of public organizations has largely been associated with accountability requirements, it has also become an instrument for encouraging service improvements through innovation (Andrews, Boyne, Jennifer, & Walker, 2008). However, some regulations may also discourage innovation by taking up a lot of organizational resources in meeting compliance and reporting requirements (Rothwell, 1980). According to Patanakul and Pinto (2014, p. 104), in order to promote and sustain innovation, "government will try to maintain a portfolio of innovation policies that set clear mandated targets than can push firms towards technological changes; policies that assist the firms in developing and improving their technical capacity; policies that emphasize the development and improvement of infrastructures and business platforms; policies that promote a quality workforce; and policies that create favorable business environment".

Managers should take advantage of the support from these government policies by leveraging their firm's strategic capabilities to enable them to capitalize and exploit innovation opportunities (Patanakul & Pinto, 2014).

In this study, the researcher seeks to investigate the impact of government and regulatory environment on exploratory and exploitative innovation in the four service organizations.

2.4.2 Internal contexts

Not only do leaders need to learn and understand their external or environmental contexts, they also need to understand their organizational (or internal) context to enable them to formulate a strategy for innovation (Gavetti & Levinthal, 2004). These leaders need to be able to look both outward to identify the external forces and inward to create an internal context for organizational learning that enables organization members to respond to these external forces (H.-E. Lin & McDonough III, 2011). Internal contexts for innovation include elements within the organizational boundaries, such as strategy (Santos-Vijande, et al., 2012), organizational structure (Raisch, 2008), organizational culture (H.-E. Lin & McDonough III, 2011; C. L. Wang & Rafiq, 2014), and organizational resources (Cohen & Levinthal, 1990; Jansen, et al., 2012; Rothaermel & Alexandre, 2009). The organizational contexts can indirectly influence the interaction between organizations' members required for organizational learning by providing conditions that support or hinder this interaction (Argote & Miron-Spektor, 2011).

Leaders need to provide internal contextual support for learning to occur in the organization to respond to changes in the external contexts (Berson, et al., 2006). Leaders need to able to foster both exploratory and exploitative learning for innovation (Rosing, et al., 2011; Vera & Crossan, 2004). They are required to facilitate both the feed-forward processes of exploration and the feed-back processes of exploitation to enable organizational learning and in turn innovation (Vera & Crossan, 2004). Rosing et al. (2011) argue that leaders need to increase variance in followers' behaviors in exploration activities, and conversely reduce variance in the followers' behaviors in exploitation activities. For example, leaders need to be able to encourage their followers to think in new directions and challenge institutionalized learning to encourage a variety of ideas and insights in the initiation phase of the innovation process. However, leaders also need to be able to narrow-down innovation initiatives and reinforce institutionalized learning in the implementation phase of the innovation process (Rosing, et al., 2011).

Leaders need to articulate a clear overarching vision to enable the pursuit of exploratory and exploitative learning (O'Reilly III & Tushman, 2011). This vision should allow an organization to have paradoxical strategies (i.e. the ability to reconcile conflicting issues in setting strategic direction e.g. cost leadership vs. differentiation) to deal with exploration and exploitation activities (W. K. Smith, Binns, & Tushman, 2010). Vision is important to create shared

understanding and common goals to guide innovation activities (Hunter & Cushenbery, 2011). Organizational vision can also create an organizational culture that is conducive for innovation (Sarros, Cooper, & Santora, 2011). While vision needs to be clear enough to provide direction for the organization, it should not be too explicit to allow for flexibility for employees to explore novel ways to achieve organizational goals (Hunter & Cushenbery, 2011).

Benner and Tushman (2015) argue that the senior leadership team is still the focal actor in dealing with paradoxical innovation (i.e. exploratory and exploitative innovation) by shaping strategy and structure to create an organizational capability to face dynamic external environments. How leaders actually manage the allocation of resources between exploration and exploitation activities and how they manage the inevitable conflicts that arise from these two conflicting activities are at the heart of leadership challenge (O'Reilly III & Tushman, 2013).

In the following section, the researcher examines how strategy influences organizational learning for innovation.

2.4.2.1 *Strategy*

A strategy is often required to guide innovation activities by providing a sense of purpose and direction (Hunter & Cushenbery, 2011). An organization's strategy formulation and implementation can have an impact on exploratory and exploitative innovation. According to Porter (1980), there are cost leadership and differentiation strategies to achieve competitive advantage. A cost-leadership strategy is used to achieve internal efficiency to provide a product and/or service at an acceptable standard but at a lower cost for customers. According to March (1991), efficiency can be associated with exploitation. A differentiation strategy, on the other hand, is implemented by organizations wanting to create unique products with added values and to offer greater benefits to customers (Porter, 1980). This differentiation strategy is closely related to variation, and March (1991) considers variation as part of exploration. In order to be more competitive, both cost-leadership and differentiation strategies need to be used to create flexibility to adapt to a dynamic environment (Santos-Vijande, et al., 2012). Li and Li (2008) argue that firms can achieve above average business performance by pursuing both differentiation and cost leadership strategies simultaneously. In addition, innovations in management and technological development have offered organizations new ways to reconcile efficiency and flexibility and thus allow a greater level of ambidexterity (Birkinshaw & Gupta, 2013). Nevertheless, firms need to avoid formulating "a stuck in the middle strategy" where they fail to successfully pursue either a differentiation or cost leadership strategy (Porter, 1980).

In this study, the researcher analyzes how strategy affects organizational learning for exploratory and exploitative innovation in four large service organizations. Implementing cost leadership or differentiation strategies require a structure that enables firms to effectively

respond to the ever-changing business environment. In the next section, the research outlines how organizational structure influences organizational learning for innovation.

2.4.2.2 *Organizational structure*

Organizations face the challenge of using organizational structures that can support both the exploitation of existing capabilities and the exploration of new opportunities (Raisch, 2008). Research has indicated that a centralized structure characterized by high levels of standardization and hierarchy allows for more efficiency, whereas a decentralized structure characterized by high levels of autonomy allows more flexibility (Raisch, 2008). As such, organizations may use decentralized structures to stimulate exploratory innovation and centralized structures to increase coordination and efficiency (Raisch, 2008).

To support both exploration and exploitation, some organizations adopt structural ambidexterity that separate exploitative and exploratory learning activities into distinct organizational units to balance between exploitation and exploration simultaneously (Raisch, et al., 2009; Tushman & O'Reilly III, 1996). The organizational unit responsible for exploratory learning is designed to be smaller, more decentralized, and more flexible than those responsible for exploitative learning (Benner & Tushman, 2003). Alternatively, structural separation can also occur in a multi-unit organization where each unit may serve different product/market segments or have distinct organizational tasks requiring a different set of competencies and expertise (Jansen, et al., 2012). The separation between exploratory and exploitative units ensures that resources are allocated for both exploration and exploitation activities (O'Reilly III & Tushman, 2011). In addition, structural separation enables exploration in new areas and exploitation in existing areas (Raisch, 2008). As mentioned previously, Jensen, Tempelaar, van den Bosch and Volberda (2009) found that structural separation enables ambidexterity via informal senior team social integration and formal cross-functional interfaces at lower levels of the organization, which act as integration mechanisms. An organization can also balance the competing demands for exploitative and exploratory learning using parallel structures (Raisch, 2008). Using parallel structures, organizational members can easily work with a mechanistic (fixed) structure for routine tasks (exploitation) and an organic (flexible) structure such as in project teams for new tasks (exploration). This parallel structure is often used to exploit and recombine existing capabilities to upgrade products that allow the exploration of new market segments or niches (Raisch, 2008).

The effectiveness of a particular organizational structure for exploitative and exploratory learning can differ across innovation activities and over time (Raisch, et al., 2009). In this study, the researcher investigates how organizational structures influence organizational learning for innovation in the four service organizations. The selection of organizational structure influences

the levels of control and flexibility in the organization and in turn affects the organizational culture (Quinn & Rohrbaugh, 1983). In the next section, how organizational culture affects organizational learning for innovation will be discussed.

2.4.2.3 *Organizational culture*

Organizational culture is about shared values and behaviors that influence the way organization members interpret their environment and how they behave in conducting business (Buschgens, Bausch, & Balkin, 2013). Leaders have the ultimate responsibility for creating an organizational culture that fosters organizational learning for innovation (Berson, et al., 2006; C.-H. Lin & Sanders, 2017). An organizational culture that allows divergence of knowledge and promotes the integration of multiple perspectives can facilitate creativity and innovation by enabling organizational members to pursue both the exploration of new knowledge and the exploitation of existing knowledge simultaneously (C. L. Wang & Rafiq, 2014).

An organizational culture that facilitates learning for innovation embodies the importance of knowledge sharing between organizational members. Knowledge sharing among organizational members can lead to creative behaviors and knowledge transfer which in turn can stimulate innovation (H.-E. Lin & McDonough III, 2011). Research on factors that facilitate or hinder knowledge sharing (see for example Cabrera and Cabrera (2005), Riege (2005)) can be beneficial to investigate how knowledge sharing can contribute to an organizational culture that is conducive for innovation. In facilitating these knowledge sharing behaviors, organizations need to foster cultural norms of behaviors that enhance interactions and collaboration among organizational members (H.-E. Lin & McDonough III, 2011). Dialogues and conversation for knowledge sharing not only assist in the interpretation process of new ideas but also facilitate the integration of the different perspectives and knowledge of these new ideas (Crossan, et al., 1999). In addition, a shared vision that is embraced by all organizational members is crucial in ensuring harmony, alleviating opportunistic behavior and potentially integrating an entire business unit (C. L. Wang & Rafiq, 2014). As such, organizations need to have a culture that fosters "unity in diversity" whereby different perspectives and a variety of ideas is encouraged while ensuring a common vision or goal for collective actions.

In this study, the researcher explores how organizational culture influences organizational learning for innovation in the researched organizations. While an organizational culture that supports diversity and encourages innovative behavior among organizational members can lead to innovation in an organization, there is still the question of whether there are adequate resources to fund innovation. In the next section, the researcher discusses how organizational resources influence organizational learning for innovation.

2.4.2.4   *Organizational resources*

Large organizations are much more likely to pursue both exploratory and exploitative learning effectively and efficiently because they have more resources and knowledge stocks (C.-Y. Lee & Huang, 2012). These are known as organizational slack, which enables a more efficient allocation of appropriate resources between exploratory and exploitative innovation (Jansen, et al., 2012). In instances whereby organizational slack is not immediately available, organizations need to manage the trade-offs between exploration and exploitation because both activities essentially compete for limited resources (Q. Cao, et al., 2009; March, 1991). The optimal relative level of exploration and exploitation may depend on an organization's capabilities in managing its resources (Sirmon, et al., 2011; Wei, et al., 2014).

Organizations often face challenges in pursuing exploratory innovation because of resource-constrained environments. The major obstacles are of an economic nature, such as lack of financial resources to fund the adoption of new technology (Sirilli & Evangelista, 1998). In this case, organizations may need to innovate using their available resources at hand i.e. to "bricolage" (Cunha, Rego, Oliveira, Rosado, & Habib, 2014). Another obstacle in successfully pursuing exploratory innovation is the inadequacy of skills and competencies to implement innovation effectively (Thakur & Hale, 2013). Organizations need to develop a human capital pool that is flexible in regards to resource availability and coordination in order to meet the changing skills requirements (C.-H. Lin & Sanders, 2017). Human resource management practices to build organizational resources, such as the provision of extensive training and job rotation, can be used to develop employees' diverse skills required for innovation. In addition, practices that enable the coordination of the sharing of knowledge between employees can be used to enable efficient allocation of resources at the organizational level (C.-H. Lin & Sanders, 2017). Practices and systems for collaborating with external partners, such as with consultants and suppliers, also need to be developed and sustained to ensure that the firm achieves and maintains its competitive edge (Schamberger, et al., 2013).

The other common resource-based obstacle for pursuing exploratory innovation is related to the organization's legacy systems in its existing technologies. The investment in a particular technology platform will affect the future technological capabilities that could be developed to support innovation and influence the organization's knowledge requirements for exploiting the technologies (Cohen & Levinthal, 1990) and yet the legacy systems may impede investments in new technologies. In this study, the researcher seeks to investigate how an organization's existing technology affects organizational learning for technological-based innovation in the four service organizations.

From the preceding discussions, it can be seen that organizational learning for ambidexterity is necessary for organizations to remain competitive and to do this, they need to be able to balance their pursuit of exploratory and exploitative learning for innovation. However, there are a number of contextual factors both external and internal to an organization that can affect its pursuit of organizational learning for innovation. While external factors may be beyond the control of the organization, internal contextual support can be provided to respond to the external context. In the next section, the researcher examines the relationship between organizational learning and innovation with the external and internal contexts examined previously.

2.5 Linking external and internal contexts with organizational learning for innovation

The most fundamental factor of innovation is "learning" (Cohen & Levinthal, 1990; R. R. Nelson & Winter, 2002). Every organization learns but they may differ in terms of the degree of learning (Gupta, et al., 2006). Therefore, understanding the role and processes of learning in developing organizational capabilities is critical in an attempt to understand innovation. Organizational learning enables the development of human resources that are critical in extending the organization's capability to innovate (Y.-L. Wang & Ellinger, 2011). Organizational learning is also central in managing the tension between exploitation and exploration activities for innovation (H.-E. Lin, et al., 2013).

Organizations can achieve ambidexterity at the organizational level in three major combinations of exploratory and exploitative learning: high exploratory learning and high exploitative learning, high exploratory learning and low exploitative learning, and low exploratory learning and high exploitative learning (Wei, et al., 2014). The optimal relative level of explorative and exploitative learning is dependent on an organization's capabilities in managing its resources (Sirmon, et al., 2011; Wei, et al., 2014). The task of managing exploration and exploitation is not static but is dynamic requiring different solutions over time to respond to a dynamic environment (Raisch, et al., 2009). Leaders need to be able to look both outward to identify the external forces and inward to create an internal context for organizational learning that enables organization members to respond to these external forces (H.-E. Lin & McDonough III, 2011). Benner and Tushman (2015) argue that the senior leadership team is still the focal actor in dealing with paradoxical innovation (i.e. exploratory and exploitative innovation) by shaping strategy and structure to create an organizational capability (internal context) to face dynamic external environments. In this study, as previously discussed, the external context is examined in terms of competition, customer demands, technology development, strategic partners, and regulatory environments, while the elements of internal context are strategy, structure, organizational culture, and organizational resources.

From an organizational learning perspective, the exploration of new knowledge stresses the processes of intuition and interpretation of 4I organizational learning (Berson, et al., 2006). Leaders need to promote exploratory ideas by encouraging organization members to think in new directions to increase variety of ideas (Rosing, et al., 2011). Leaders often encounter the most tension between exploration of new knowledge and exploitation of existing knowledge in the integrating phase of 4I organizational learning (Berson, et al., 2006), with the most difficult integration process being resource allocation with individuals or groups often competing for scarce resources (Crossan & Berdrow, 2003). On the other hand, the exploitation of existing knowledge emphasizes the process of institutionalization of 4I organizational learning (Berson, et al., 2006).

With the underlying assumption that leaders are the focal actors who facilitate organizational learning, this study tries to identify how these leaders provide internal contextual support to facilitate ambidextrous learning for innovation in each of 4I learning phases, similar to Berson et al.'s (2006) framework. However, this study differs from Berson et al.'s framework as it strives to incorporate the role of context in facilitating ambidextrous learning. This is because leaders need to understand the situational context and develop capability to effectively adjust the organizational or internal context to the demands of the dynamic external environment in order to achieve ambidexterity (Almahendra & Ambos, 2015; Benner & Tushman, 2015).

Argote and Miron-Spektor (2011) argue that organizational learning may change the organization's context which in turn affects the organizations' future learning, creating a self-reinforcing mechanism. An understanding of the organization's context enables an organization's leaders to provide internal contextual support to nurture organizational learning for the changing environment. Organizations need to balance exploration and exploitation in organizational learning (ambidexterity) to be able to respond to the dynamic environment (March, 1991). Using the 4I organizational learning framework, the researcher will examine how organizational leaders in four large service organizations manage the tension between exploration and exploitation in organizational learning in order to respond to external challenges.

Leaders may also need to provide internal contextual support to facilitate the pursuit of temporal (sequential), structural, and contextual approaches to achieve ambidexterity. For example, the establishment of separated units for exploration can facilitate exploration in the intuiting phase. However, since these exploratory "units" tends to work in isolation, the integration may also need to take place at individual level (contextual ambidexterity) where cross-functional team members can facilitate knowledge exchange and coordination between exploratory "units" and the rest of the organization. As such, these individual cross-functional team members can address both exploitation and exploration in different structural environments (e.g. participating

in a temporal project team for exploration while still doing daily jobs in their own functional departments). Due to its cyclical nature, temporal ambidexterity may only be visible in the longer term involving more than one cycle of 4I organizational learning. For example, the adoption of new (and often costly) exploratory technology will be followed by a long period of exploitation to enable the organization to reap financial benefits from the refinement of this technology. However, this can only be observed in a longer period of time.

Benner and Tushman (2015) in looking back over the ten years in which their original article 'Exploitation, Exploration, and Process Management: The Productivity Dilemma Revisited' was published and in looking towards the future, suggest that the process and nature of innovation needs to be revisited. This is because of the implications of decreasing costs of communication and information processing, the increasing modularity of products and services and production of innovation beyond the organization's boundary (i.e. open innovation) on innovation research.

In this research, the innovation phenomena in four large service organizations is examined to determine if organizational ambidexterity for innovation remains relevant in the contexts they face and if organizational leaders continue to be the focal role for managing ambidexterity.

Therefore, the central question that will be addressed in this study is:

- How do organizational leaders facilitate organizational learning ambidexterity for innovation in order to respond to external challenges?

In order to answer such a question, the following sub-questions will be addressed:

a) How do external contexts (in terms of competition, customer demands, technology development, strategic partners, and regulatory environments) affect innovation?

b) How do leaders facilitate exploratory and exploitative learning within the process of 4I organizational learning to pursue innovation?

2.6 Chapter summary and theoretical framework

There has been a consensus on the need to balance the tension between exploratory and exploitative organizational learning (Raisch & Birkinshaw, 2008). The underlying process of the tension between exploratory and exploitative learning can be examined using the 4I framework that consists of intuiting, interpreting, integrating, and institutionalizing processes. Intuiting and interpreting is related to how organization members develop and share ideas. Integrating is achieved when the members share common understanding about those ideas. Institutionalizing is the process of embedding the lessons learned about the ideas in the organizational systems, structures, strategy, routines, and infrastructures. These sequences, called "feed-forward" learning, explain how learning processes at an individual-level aggregate up to the organizational level. Conversely, "feedback" learning sequences explain how the institutionalized learning feeds back from the organization to group and individual levels

(Crossan, et al., 1999). The interaction between organizational learning and context (Argote & Miron-Spektor, 2011) needs to be observed to identify the internal and external factors that potentially affect organizational learning for innovation. Leaders make strategic choices based on the evaluation of information from the internal and external environment that leads to internal adjustments (such as new structure or technology) and/or external oriented outcomes (such as new services) (Child, 1997). In other words, leaders are expected to be able to identify external factors and internal factors and then select an appropriate strategy that reflects the uniqueness of the organization's resources for organizational learning in the pursuit of both exploratory and exploitative innovation. They balance exploration and exploitation using the three major, high-level mechanisms i.e. temporal (or sequential), structural, and contextual ambidexterity. Therefore, the following theoretical framework is proposed to provide the big picture of the process of organizational learning ambidexterity for innovation in service organizations (Figure 2.2).
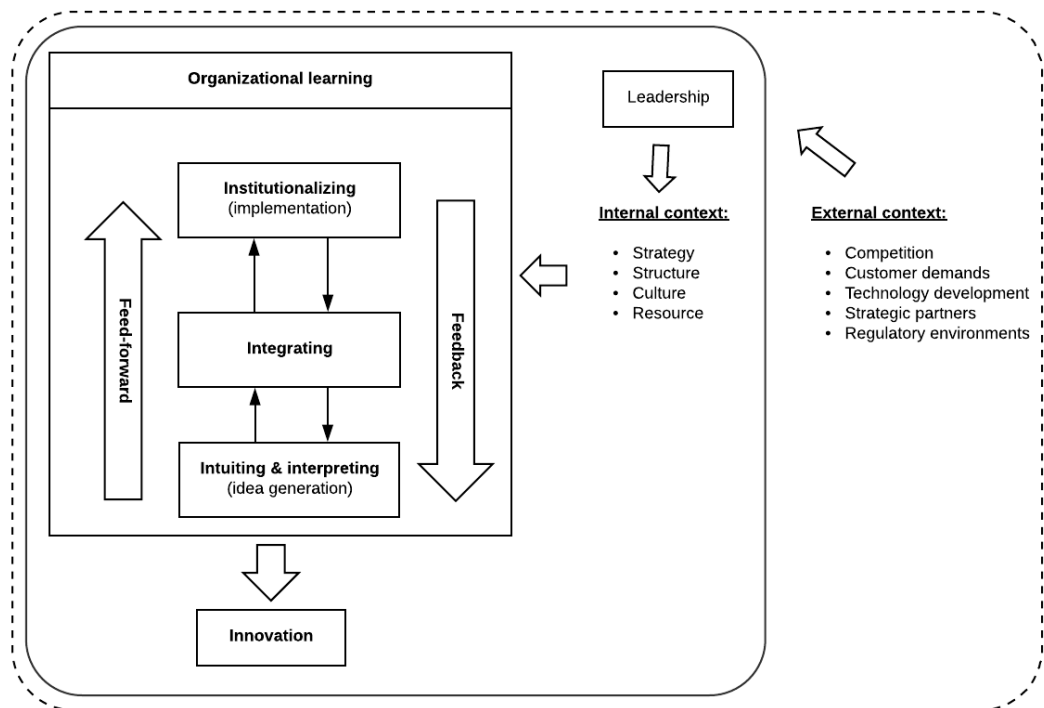
Figure 2.2: Organizational learning ambidexterity for innovation

Chapter 3: Research Methodology

3.1 Introduction

The aim of this chapter is to explain the methods employed by the researcher in this study to understand how organizational contexts, both external and internal, affected organizational learning for innovation and the role leaders in the organizations played in shaping the learning. The researcher first presents the research questions and then discusses the research paradigms of positivism and interpretivism, showing that the latter is more appropriate to understand the phenomenon under investigation. This then leads on to a discussion about the effect of the research paradigm on the selection of a research methodology. The researcher presents both the quantitative and qualitative approaches illustrating why the qualitative approach is the most appropriate in this study. Next, the researcher examines the role of the case study methodology and the role that multiple-case study plays in this research. Following this, the researcher examines the issues of validity and reliability and how they are addressed in this study. A brief discussion of the four cases is then undertaken and data collection and analysis is described. Finally, the researcher concludes the chapter with a summary of the discussion on the research methodology adopted in this study.

The research approach adopted by a researcher is contingent on what is being investigated (Leonard-Barton, 1990). Based on the literature, the researcher identified a gap in our understanding of the role leaders in large service organizations play in organizational learning for innovation. This research was therefore concerned with answering a central question and two subsidiary questions related to the role of leaders and context in organizational learning ambidexterity for innovation:

RQ : How do organizational leaders facilitate organizational learning ambidexterity for innovation in order to respond to external challenges?

RQ(i) : How do external contexts (in terms of competition, customer demands, technology development, strategic partners, and regulatory environments) affect innovation?

RQ(ii) : How do leaders facilitate exploratory and exploitative learning within the process of 4I organizational learning to pursue innovation?

Organizations need to both explore new knowledge and exploit existing knowledge to innovate and survive in changing environments (March, 1991; Raisch & Birkinshaw, 2008). How decision makers perceive the environmental context affects organizational learning and in turn innovation in an organization (Y.-L. Wang & Ellinger, 2011; Weerawardena, et al., 2006).

Organizational leaders need to consider both external and internal elements in order to provide contextual support to foster both exploratory and exploitative learning for innovation (Berson, et al., 2006; Rosing, et al., 2011). In this study, the researcher conceptualized the elements of the external context as competition, customer demands, technology development, strategic partners, and regulatory environments, whereas the elements of the internal context are conceptualized as strategy, structure, organizational culture, and organizational resources.

3.2 Research paradigm

A research paradigm is required for guiding how the research should be carried out vis-à-vis research design, data collection, and analysis (Collis & Hussey, 2009). The two most common paradigms are positivism and interpretivism. The main differences between them are related to ontological, epistemological, and axiological assumptions (Collis & Hussey, 2009). First, the research paradigm reflects the way the researcher views the nature of reality (ontology). Positivists believe that reality exists independent of the researcher, whereas interpretivists argue that social reality is multiple, depending on the way people see it (Collis & Hussey, 2009; Sekaran & Bougie, 2013).

Second, the research paradigm dictates the kind of knowledge sought by the researcher or epistemology (Collis & Hussey, 2009; Sekaran & Bougie, 2013). Positivists maintain an objectivist stance in which only observable and measurable phenomena can be accepted as valid knowledge. On the contrary, interpretivists minimize the distance between the researcher and the phenomenon being researched in order to understand how people see their world as they interact with others in their natural setting.

Third, the research paradigm shapes the researcher's role of values or axiology (Collis & Hussey, 2009; Sekaran & Bougie, 2013). Positivists contend the process of research to be value-free and unbiased, whereas interpretivists recognize that the interactions between researcher and those being researched, as well as the researcher's values, might influence the interpretation derived from the social reality. The assumptions related to the two extreme research paradigms are summarized in Table 3.1.

Features	Positivism	Interpretivism
Ontological assumption (the nature of reality)	Reality is objective and singular, separate from the researcher	Reality is subjective and multiple, as seen by participants
Epistemological assumption (what constitutes valid knowledge)	Researcher is independent of that being researched	Researcher interacts with that being researched
Axiological assumption (the role of values)	Research is value-free and unbiased	Researcher acknowledges that research is value-laden and biases are present
Rhetorical assumption	Researcher writes in a formal	Researcher writes in an

Features	Positivism	Interpretivism
(the language of research)	style and uses the passive voice, accepted quantitative words and set definitions	informal style and uses the personal voice, accepted qualitative terms and limited definitions
Methodological assumption (the process of research)	• Process is deductive • Study of cause and effect with a static design (categories are isolated beforehand) • Research is context free • Generalizations lead to prediction, explanation and understanding • Results are accurate and reliable through validity and reliability	• Process is inductive • Study of mutual simultaneous shaping of factors with an emerging design (categories are identified during the process) • Research is context bound • Patterns and/or theories are developed for understanding • Findings are accurate and reliable through verification

Table 3.1: Assumptions of the two main research paradigms (Collis & Hussey (2009))

In this study, the researcher sought to understand the way organizational leaders of particular organizations perceived or interpreted the external and internal contexts and how both these contexts affected the kind of organizational learning for innovation that occurred in the organizations. The research was thus context-bound. The researcher examined how the interactions among organizational members in a real-life context occurred in order for the requisite organizational learning to take place. The reality of the phenomenon was subjective with each participant having their view of reality. Furthermore, innovation involves a highly uncertain and complex type of behavior and lends itself to the interpretive perspective that allows understanding from the point of view of the relevant actors in the innovation process (Van de Ven & Rogers, 1988). As such, the interpretivist paradigm was the best approach to answer the research questions in this study.

3.2.1 Impact of research paradigms on research methodology

In relation to methodological issues, the two main research approaches are generally quantitative and qualitative research (Bryman & Bell, 2003). In line with the positivist paradigm, quantitative research can be understood as a deductive approach that is intended to test theories using statistical and mathematical procedures. Following the interpretivist paradigm, qualitative research is an inductive approach aimed to generate an in-depth understanding of a particular situation (Bryman & Bell, 2003; Cooper & Schindler, 2008). Several key distinctive features of both quantitative and qualitative research are presented in Table 3.2.

Features	Quantitative	Qualitative
Research paradigm	Positivist	Interpretivist
Sample design	Probability	Non-probability; purposive
Sample size	Large	Small
Research purpose	Testing hypotheses	Generating hypotheses
Research design	• Determined before commencing the project • Uses single method or mixed methods • Consistency is critical	• May evolve or adjust during the course of the project • Often uses multiple methods simultaneously or sequentially • Consistency is not expected
Participant preparation	No preparation desired to avoid biasing the participant	Pre-tasking is common
Data type	• Produce precise, objective, quantitative data • Reduced to numerical codes for computerized analysis	• Produce 'rich', subjective, qualitative data • Reduced to verbal codes (sometimes with computer assistance)
Data analysis	• Computerized analysis – statistical and mathematical methods dominate • Analysis may be ongoing during the project • Maintain clear distinction between facts and judgments	• Human analysis following computer or human coding; primarily non-quantitative • Forces researcher to see the contextual framework of the phenomenon being measured – distinction between facts and judgments less clear • Always ongoing during the project
Insights and meaning	• Limited by the opportunity to probe respondents and the quality of the original data collection instrument • Insights follow data collection and data entry, with limited ability to re-interview participants	• Deeper level of understanding is the norm; determined by the type and quantity of free-response questions • Researcher participation in data collection allows insights to form and be tested during the process
Feedback turnaround	• Larger sample sizes lengthen data collection • Insight development follows data collection and entry, lengthening research process	• Smaller sample sizes make data collection faster for shorter possible turnaround • Insights are developed as the research progresses, shortening data analysis
Findings	• Allow results to be generalized from the sample to the population	• Allow findings to be generalized from one setting to another similar setting

Table 3.2: Quantitative versus qualitative research (adapted from Bryman & Bell (2003); Collis & Hussey (2009); Cooper & Schindler (2008))

A qualitative approach was undertaken for this study because it can offer greater clarity in explaining what leaders actually do to manage exploitation and exploration and how they manage the inevitable conflicts that arise from these two conflicting activities. This is in line with O'Reilly III and Tushman's (2013) argument that more qualitative research is required to

answer how senior team and leadership behaviors address the conflicting demands of exploration and exploitation. In addition, a qualitative approach enables researchers to know what "exploration" and "exploitation" actually mean in the contexts of the organization under investigation (O'Reilly III & Tushman, 2013). This is important because this study used four service organizations in different sectors and what exploration and exploitation meant for each could be different given the context of the sector. Furthermore, the type of innovation and how the researched organization pursued these innovations could differ due to the idiosyncratic nature of the underlying phenomena in each of these organizations. In short, the nature of this research suits the qualitative approach.

3.3   Case studies

Case studies are often related to qualitative research design and commonly used in management research (Tharenou, Donohue, & Cooper, 2007), specifically in the field of organizational learning (S. Li, Easterby-Smith, & Bartunek, 2009). A case study is an in-depth, empirical inquiry that investigates a contemporary phenomenon in its natural setting (Tharenou, et al., 2007; Yin, 2009). Case study is the preferred method when the research meets the following criteria (Yin, 2009). First, the research asks 'how', 'why', or exploratory 'what' questions. The form of the research question suggests that this study seeks to clarify and understand 'how' leaders facilitate organizational learning ambidexterity for innovation in order to respond to external challenges. Second, the researcher has no control over actual behavioral events. In this study, the researcher did not have any control over the learning and innovation processes happening in the organizations being investigated. Lastly, the study focuses on contemporary events, where the researcher had the opportunity to undertake direct observation of the events (related to the learning and innovation processes) and conduct interviews of the people who were still accessible and able to recall the events relatively accurately. Thus, case study was viewed as the most appropriate method to conduct this research.

There are two main types of case study. A single-case focuses on one case only, whereas multiple case studies involve two or more cases within the same study (Tharenou, et al., 2007; Yin, 2009). A single case or multiple cases may include more than one unit of analysis, resulting in embedded case study design. On the contrary, a holistic design is applied if the case study only investigates the global nature of an organization (Yin, 2009). Compared to a single case, multiple cases enable the researcher to conduct a cross-case analysis to compare and contrast the multiple case findings in order to understand the 'replications' of a general phenomenon (Yin, 2009). The unit of analysis in this study is the organization and four mini cases of large service organizations are used as a multiple case study method.

3.3.1 Research model

The initial steps in designing multiple case studies include theory development, case selection, and measure specification (Yin, 2009). The literature review undertaken in Chapter 2 assists in developing the theoretical framework for this study. The researcher applied the 'replication' design to select four organizations for this study where each case had the potential to either predict similar results (a literal replication) or contrasting results with anticipatable reasons (a theoretical replication). This study used a convenience sample (organizations the researcher could get easy access to) that was purposive (service organizations that are committed to and engaged in innovation). Organizational learning processes were assessed or 'measured' using the 4I framework (Crossan, et al., 1999).

The next steps of a multi-case study approach involve data collection from each case using multiple sources of evidence. The data gathering method for this study will be discussed in Section 3.6. A within-case analysis was carried out in order to map the proposed model to the context of each individual organization.

The final steps include a cross-case analysis to compare and contrast the findings from the cases (Yin, 2009). The similarities and differences of conditions among the organizations were investigated in order to ascertain whether the results converged to confirm the proposed model. The research model for this research is shown in Figure 3.1.
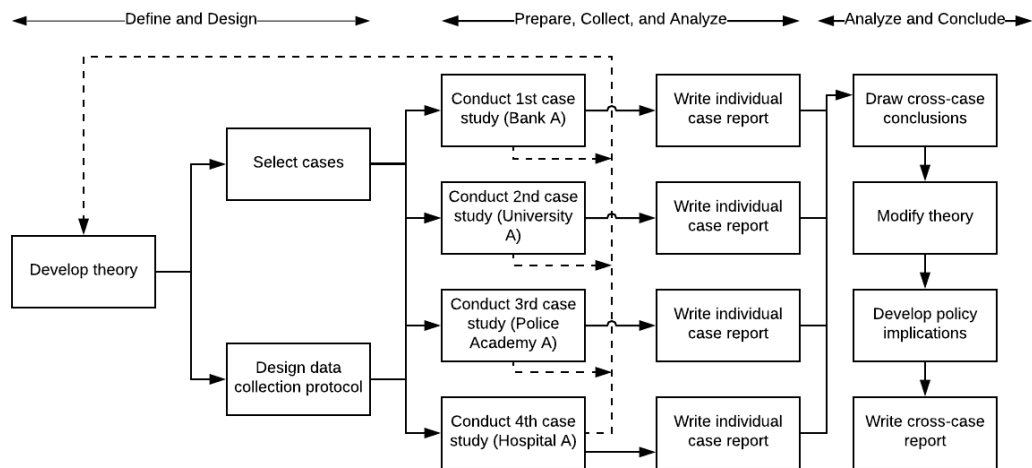
Figure 3.1: Case study method (adapted from Yin (2009))

3.4 Validity and reliability

Both validity and reliability are important issues in enhancing quality and rigor in qualitative research because they demonstrate the credibility and relevance of the understanding and interpretation of the study (Silverman, 2011). There are four tests commonly used to evaluate

the quality of empirical management research, specifically for case study: construct validity, internal validity, external validity, and reliability (Gibbert, Ruigrok, & Wicki, 2008; Yin, 2009). Each will be discussed in the following sections. The four tests for investigating the methodological rigor of qualitative case study are presented in Table 3.3 together with the tactics used in this research.

Test	Case Study Tactic in This Research
Construct validity	• Data triangulation through the use of multiple sources of evidence: documentation, archival data, interview data, direct observation derived data, physical artifacts • Clear chain of evidence • Review of transcripts and draft by peers (PhD supervisor)
Internal validity	• Research framework derived from literature • Pattern matching • Theory triangulation
External validity	• Replication logic in multiple-case studies • Rationale for case study selection • Details on case study context
Reliability	• Case study protocol • Case study database (NVIVO)

Table 3.3: Tactics for ensuring the methodological rigor for case studies (adapted from Gibbert et al (2008); Yin (2009))

3.4.1   Construct validity

Construct validity refers to the use of correct operational measures for the concepts being studied during the data collection phase (Yin, 2009). Case study researchers often use 'subjective' judgments instead of well-developed sets of measures in collecting the data (Yin, 2009). This research applied three strategies for increasing construct validity (Gibbert, et al., 2008; Yin, 2009). First, this research utilized triangulation from multiple sources of evidence using different methods, with data collected from archival data (web pages, press releases, annual reports, and other relevant documents), participant interviews (interview transcripts), and direct observations in the field (with field notes) to promote convergent lines of inquiry. In-depth semi-structured interviews involved multi-respondents from different levels of management across different functions of each organization. These interview respondents were asked about the innovations in their organization in the last three years and the enabling factors. Asking the respondents about past events could possibly result in faulty recall impacting the quality of data (Miller, 2003). However, reporting retrospective data in the last 3 years is still considered appropriate (Aragon-Correa, Garcia-Morales, & Cordon-Pozo, 2007). The documentary sources (e.g. firm performance reports, reviews from independent organizations) were also used to support the respondents' subjective perceptions in measuring the innovation outcomes. Second, this research provides a chain of evidence by presenting direct quotes or evidence from the multiple sources to support interpretations and the conclusions that have been made. Third, the interview transcripts and the draft of the case study report were reviewed by the researcher's academic supervisors.

3.4.2 External validity

External validity or generalizability refers to the extent to which the case study findings are applicable to other situations (Gibbert, et al., 2008; Yin, 2009). One of the reasons researchers may struggle with choosing to use case studies is that generalizability has been the major concern, especially in single case studies (Yin, 2009). However, the case study approach can provide analytic generalization that refers to the generalization from empirical findings to some broader theory (Yin, 2009). Multiple cases enable the replication logic in which the findings in the cases demonstrate the underlying theory. Therefore, the choice of case study also contributes to the issues of generalizability (Gibbert, et al., 2008; Silverman, 2011). The details of the case study context provide more information on the judgment of the case selection (Gibbert, et al., 2008) and that is discussed in Chapter 4 to 7 where each of the cases is presented and analyzed using the framework determined via the literature review.

3.4.3 Internal validity

Internal validity refers to logical validity explaining the causal relationship between variables and results (Gibbert, et al., 2008; Yin, 2009). There are three strategies for enhancing internal validity (Gibbert, et al., 2008) and these are addressed in this study. First, a clear research framework derived from the literature is presented in Chapter 2. Second, the researcher conducted pattern matching by comparing empirical findings across cases and with previous studies from the literature conducted in different contexts. Third, the researcher adopted multiple theoretical perspectives to verify findings (theory triangulation) i.e. organizational learning, ambidexterity, leadership, and strategy.

3.4.4 Reliability

Reliability refers to 'replicability' that questions whether or not another researcher could replicate the research and obtain the same results (Gibbert, et al., 2008; Silverman, 2011; Yin, 2009). In order to facilitate the replication of the case study by other investigators, a case study database (N*Vivo) was used to maintain all data collected from the research for easy retrieval (Gibbert, et al., 2008; Yin, 2009). The detailed description of the research design and data analysis methods, describing how the whole case study had been undertaken (presented in the following sections), makes the process more transparent (Gibbert, et al., 2008; Yin, 2009). In addition, Silverman (2011) has suggested for the analysis of the data to be done by multiple researchers to ensure reliability. In this study, the suggestion was followed by involving the researcher's academic supervisors to ensure the consistency of case study analysis.

3.5 Ethical considerations

Ethical considerations for this research are mainly related to voluntary participation as well as anonymity and confidentiality (Collis & Hussey, 2009; Sekaran & Bougie, 2013). In line with Edith Cowan University's guidelines and regulations, authorization was obtained from the university's ethics committee prior to the data collection. Prospective respondents were asked to participate in the research project voluntarily and were guaranteed anonymity. The permission from the authorized person in the participating organization was granted prior to collecting data from individuals. In addition, all data related to the research project will continue to be kept for the requisite number of years as prescribed by the University's guidelines.

3.6 Cases

There were four cases that were part of the study. The first case was a regional bank located in an Australian state and is owned by one of the four major banks. The bank had won several industry awards reflecting its innovative achievements within the industry, such as the AFR Smart Investor Blue Ribbon Award, Money Magazines Award, and Interactive Media Award. The bank also demonstrated significant financial performance in 2012 and received good feedback for customer satisfaction. Roy Morgan Main Financial Institution reported that the bank under examination had relatively high customer satisfaction.

The second case was an Australian public university with large multi-campuses serving local and international communities. The university had achieved a 5 star rating for teaching quality, generic skills, and overall graduate satisfaction for seven consecutive years, as published in the Good Universities Guide. According to the 2012 audit report of TEQSA (Tertiary Education Quality and Standards Agency), the university achieved significant changes in three related areas: "a renewed attention to engaging with the community, a major curriculum reform project, and a consistent approach to internationalization".

The third case was a police academy which provided training and education for police officers in one of eight jurisdictions in Australia. The police academy had been awarded the National Employer of The Year (Australian Training Industry Award – Government) for delivering innovative in-service training in the areas of use of force, investigative practices, and driver training. The academy also has a high-tech training facility that includes an interactive tactical training simulator and a full-scale scenario village.

The fourth case was a private hospital in an Australian state that caters for both private and public patients and is owned by one of Australia's largest private hospital operators. The hospital underwent an extensive redevelopment project from 2009 and was mostly completed in 2013. As part of the expansion of these facilities, the hospital recruited hundreds of additional staff, acquired new medical equipment, and offered new medical services. For example, the

hospital was able to offer the first cardiac service offering in the state involving the implantation of the smallest cardiac monitor into patients suffering from irregular heartbeat.

Thus, the four cases were all large service organizations in the same Australian state but they were in different industries. The multiple-case design allows for the examination of differences and similarities between the cases and the role of different contexts in organizational learning for innovation.

3.7 Data collection

The problem of access is often found in qualitative research, especially for research in institutions (Flick, 2009). This could be due to the fact that institutions often view research as a disturbance that can potentially interrupt routines, with lack of visible benefits for the institutions and its members. In this study, the researcher experienced difficulties in gaining access to the prospective institutions. The researcher sent invitation letters to 15 innovative service institutions via email to gain permission to conduct research. These letters were addressed to Human Resources managers or other relevant contact persons. The researcher also made telephone calls to these institutions to confirm their willingness to participate in the study. However, many of these institutions refused the research request. There were five institutions that were interested to participate in the research. One institution withdrew from this study before the data collection began because they had heavy workloads during the specified time for the research. The other four institutions continued their participation in this study.

There was a key person or an area in each institution that was responsible for authorizing the research. Once the research approval was granted, the researcher identified the potential respondents and arranged the interview schedules. Most organizations in this study (except the university) provided the list of respondents and arranged the time for interviews. When respondents identified another person who could provide additional information, the researcher needed to seek approval from the institution to add this person to the respondent list. The researcher also faced the problem of limited access to individuals in each institution. The respondents were selected to represent different levels of management from different functional areas. However, the researcher often could not gain access to all relevant individuals in institutions. For example, some prospective respondents at the university were unwilling to take part in the research. In addition, the researcher found it difficult to arrange the interview schedules with the bank's employees because they were very busy. Nevertheless, the researcher had been able to obtain 29 respondents from four organizations, mostly from top and middle managerial levels. The details of interview activities are as follows in Table 3.4.

No	Institutions	Number of participants	Time of interviews
1	Bank	6	April 2013, July 2013, and December 2013 (3 batches)
2	University	12	April – July 2014
3	Police Academy	5	October 2013 (1 batch)
4	Hospital	6	January 2014 and February 2014 (2 batches)

Table 3.4: Participating institutions

The interview is the main data collection technique for qualitative research (Cooper & Schindler, 2008; Silverman, 2011). One of the key strengths of interviews is to gain a better understanding of the interviewees' views, perceptions, and values (Silverman, 2011). In this study, the researcher used interviews as the key data collection method since interviews allowed an understanding from the perspective of the participants involved in the learning and innovation processes at the organization being studied. According to Cooper and Schindler (2008), there are three types of interviews: unstructured interviews (conversational interviews with no standard questions), semi-structured interviews (conversational interviews with less standardization on the questions allowing the interviewer to probe further), and structured interviews (using a predefined set of questions with high standardization). In this study, semi-structured interviews were applied to enable the researcher to seek clarification and elaboration of answers from the interviewees in order to obtain rich details of data. The lengths of the interviews conducted in this study varied between 20 to 90 minutes but were an hour on average. Interview questions were adapted from Crossan and Berdrow's (2003) interview protocol by incorporating explicit questions related to external and internal contexts that might influence innovation (Appendix 2).

Interviews can be done either face-to-face or over the telephone assisted by information technology (Sekaran & Bougie, 2013). In this study, 28 interviews were conducted in a face-to-face mode enabling the researcher to observe the respondent's non-verbal language, and facilitate open conversation, as proposed by Sekaran and Bougie (2013). In addition, having face to face interviews enabled the participants to be more focused on the interviews. The interview setting has a strong influence on the way interviews progress and as such, the setting was ensured to be comfortable, private, and quiet (King & Horrocks, 2010). For this research, the interviews were conducted at the meeting room in the office building where the participant worked. These allowed the participants to feel more comfortable as it was done at the participant's convenience and in private manner. However, one interview was conducted over the telephone because the respondent was based in other state. Interviews were tape-recorded and transcribed before analysis was conducted. The use of multiple sources of evidence (interview transcripts, relevant documents, and field notes) in this study was highly complementary and useful for data triangulation.

3.8 Data analysis

In this study, interview data were classified thematically in chronological order based on the predetermined framework and compared to the corresponding documentary sources (web pages, press releases, annual reports, and other relevant documents) to build interpretations. According to Argote and Miron-Spektor (2011), the external and internal contexts affect organizational learning. The researcher began with the investigation of how the external environment (in terms of competition, customer demands, technology development, strategic partners, and regulatory environments) affected innovation in the four organizations. The researcher then analyzed how leaders in these organizations responded to the external environment by controlling and adjusting the internal organizational context and the underlying organizational learning to pursue the identified innovations.

Using the 4I framework (Crossan, et al., 1999) presented in the literature review chapter as the framework for understanding organizational learning processes, the researcher examined how exploratory and exploitative learning under the categories of intuiting, interpreting, integrating, and institutionalizing facilitated the innovations. In the intuiting phase, the researcher focused on how leaders stimulated individual organizational members' creativity by developing their competences and motivating them to innovate through the creation of a conducive working environment. In the interpreting phase, the researcher examined how leaders provided a shared interpretation for guiding innovation activities and facilitated constructive dialogues to allow the acceptance of new ideas and insights. In the integrating phase, the researcher investigated how leaders guided the integration of new and existing knowledge by facilitating a shared understanding at both the group and organizational level to allow for coherent and collective actions. Lastly, in the institutionalizing phase, the researcher explored how leaders facilitated the organization-wide implementation and adoption of innovation as well as institutionalized new knowledge in such a way that enabled the simultaneous pursuit of exploration and exploitation.

Finally, the researcher sought to comprehend how leaders of large service organization in Australia actually facilitate organizational learning ambidexterity for innovation in order to respond to external challenges. Each case was cross-referenced to the theoretical framework via pattern-matching logic. A within-case analysis was conducted to map the proposed model to the context of the individual case. Then, a cross-case analysis was undertaken to provide the overall findings from the four cases.

3.9 Chapter summary

In this chapter, the researcher discusses the research methodology of this study. The purpose of this research is to examine how organizational leaders facilitate organizational learning

ambidexterity for innovation in order to respond to external challenges. The researcher stipulated the elements of the external context as competition, customer demands, technology development, strategic partners, and regulatory environments; whereas the elements of the internal contexts were strategy, structure, organizational culture, and organizational resources. The researcher investigated how these external and internal contexts affected organizational learning and in turn innovation. According to Crossan et al. (1999), organizational learning process can be categorized by the 4I framework: intuiting, interpreting, integrating, and institutionalizing. The researcher explored how these external and internal contexts interacted during each organizational learning phase. In this way, the researcher attempted to understand how organizational leaders strived to achieve organizational learning ambidexterity for innovation in order to respond to external challenges.

In this study, a qualitative approach within the interpretivist paradigm was undertaken as qualitative research could offer a greater understanding of the links between the role of leaders and the organization's contexts in influencing organizational learning and innovation. There were four cases in this study involving service organizations: a private regional bank, a public university, a police academy, and a private hospital (with public contracts). To enhance the quality and rigor in this study, the researcher applied tactics to ensure construct validity, internal validity, and reliability. The main data collection technique was interviews complemented with the archival data (web pages, press releases, annual reports, and other relevant documents) and direct observations on the field (field notes) to enable data triangulation. Gaining access to institutions was a significant problem during the data collection phase. Within-case analysis was undertaken to map the proposed framework to the context of individual organizations and finally cross-case analysis was done to compare and contrast the findings from the cases.

Chapter 4: Bank A - Case analysis

4.1 Introduction

In this chapter, the researcher discusses his analysis of the data from the mini case of Bank A. The bank being researched is a regional bank located in an Australian state (State A) owned by one of the four major banks in Australia. These four banks, also known as "the Big Four", are Australia New Zealand Banking Group (ANZ), Commonwealth Bank of Australia (CBA), National Australia Bank (NAB) and Westpac Banking Corporation (WBC). Bank A has a brand name that is different from its parent bank. In terms of reporting, the Australian Prudential Regulation Authority (APRA) did not list Bank A individually but included it under its parent bank. Bank A started in the late 18th century as a rural lender to support the state's farming industries. The bank gradually changed and started trading under the name of Bank A in 1994. The global financial crisis (GFC) in 2008 forced this bank to merge with one of the big four banks. Since then, Bank A has been improving and has achieved several industrial awards. In 2013, Bank A employed more than 5,000 people throughout Australia. Bank A was chosen in this study because it had been recognized for its commitment to offering business owners competitive deposits, credit cards, and lending solutions with flexible options to suit their needs in the prestigious "Financial Review Smart Investor Blue Ribbon Awards". It was also named Bank of the Year 2010, 2011, 2012. In addition, Bank A had considerable investments in technological-based innovation.

The data in this study were collected from observations of a two-day event of dedicated innovation activities (held quarterly) in the bank headquarters as well as from a guided tour around the office building, and data from the corporate website, the press releases, and annual reports. In addition, interviews with six of the bank's employees were conducted between early April 2013 and end of December 2013. Of the six interviews, one was conducted by telephone as the interviewee was located in another state while other five interviews were done face-to-face. The details of participants are summarized in Table 4.1.

No	Participant's position
1	Senior Manager of Innovation (IT)
2	Senior Manager of Architecture (IT)
3	IT Specialist
4	Associate IT Specialist
5	Senior Product Manager-A (Business)
6	Senior Product Manager-B (Business)

Table 4.1: Participants' details

In this chapter, the researcher begins with an investigation of the external context faced by Bank A. The researcher then analyzes how Bank A's leaders responded to the external context by controlling and adjusting the internal context and consequently facilitating its organizational learning to pursue innovation. Senior leaders have an important role in managing both exploratory and exploitative innovation (Benner & Tushman, 2015; O'Reilly III & Tushman, 2013). Using the 4I framework (Crossan, et al., 1999) presented in the literature review chapter as the framework for understanding organizational learning processes, the researcher examines the organizational learning processes at Bank A under the categories of intuiting, interpreting, integrating, and institutionalizing. Berson et al. (2006) argue that exploration emphasizes the 4I learning processes of entrepreneurial intuition (new knowledge with future orientation) and interpretation whereas exploitation focuses on the process of institutionalization. The intuiting and interpreting processes can be associated with the process of idea generation. Conversely, the institutionalization process can be linked to the process of embedding the new learning into routines, structures, and practices of the organization. During the integration process, leaders often face intensified tension between exploring new knowledge and exploiting existing knowledge and Bank A's learning processes for innovation are examined in this light. The researcher concludes this chapter with a discussion of how Bank A pursued organizational learning ambidexterity in response to its external challenges.

4.2 External context

Bank A's external context will be examined in terms of competition, customer demands, technology development, strategic partners, and regulatory environment. These constructs were identified in the literature review chapter as having an influence on innovation and the underlying learning of an organization.

Banking deregulation began in the early 1980s stimulating the introduction of financial product innovations and globalization of the Australian market (Cejnar, 2009; Kirkwood & Nahm, 2006; Roberts & Amit, 2003). Technological developments with greater internet access contributed to these financial product and process innovations (Cejnar, 2009; Roberts & Amit, 2003) and have changed the business processes and the required employees' skills (Kirsch & Wailes, 2012). The technological changes have driven improvements in both banking services and profit efficiencies, especially for the big four banks (Kirkwood & Nahm, 2006). Nevertheless, according to Crooks (2013), the Australian financial services sector struggles to balance risk-aversion and regulatory-driven reliability with the need to innovate to stay competitive.

Since the 2008 global financial crisis, banks in Australia had to operate very efficiently to be able to compete competitively in an environment of subdued economic growth. As such, Bank A had to remove unnecessary operating costs and adopt technological-based innovation to

improve its productivity and efficiency. It adopted more advanced online and mobile banking technology because this technology has become a necessity in conducting business within the Australian banking industry. Most innovations in Bank A were process innovations linked to efficiency (exploitation) i.e. incremental business process improvements although some of these process improvements can be considered as radical or exploratory innovation e.g. virtual national call center.

However, Bank A could not compete competitively merely based on cost effectiveness and as such it also had to differentiate its product/service offerings by customizing its products to cater to the particular needs of the targeted customer groups. In this way, it tried to pursue both cost-leadership and differentiation strategies simultaneously although it tended to focus more on efficiency rather than on product differentiation in the face of a resource-constrained environment.

In the next section, the researcher examines how innovation at Bank A was influenced by competition.

4.2.1 Competition

Australia has been facing slow economic growth since the global financial crisis (Uren, 2015) which further intensified domestic competition. Financial services companies that sought profit growth had to compete in an environment of subdued economic growth. As a result, banks in Australia had to perform very efficiently in order to deliver competitive products and they had to innovate. The focus on innovation is illustrated by the following comments from several members of Bank A:

> *The need to innovate is to stay ahead of the game*. (Senior Manager of Architecture)
>
> *If competitors start to steal market share from us, we need to look at ways of how we can innovate and claw that back.* (Senior Product Manager-A)

In Australia, there were 71 banks operating with total resident assets of A\$2.9 trillion at the time of study as at 31 March 2014 (Australian Prudential Regulation Authority, 2014). These consisted of 21 domestic banks, 8 foreign-subsidiary banks, and 42 foreign-branch banks with the Big Four banks accounting for 79.9 per cent of resident assets (A\$2.3 trillion). While Bikker and Haaf (2002) are of the opinion that market concentration can weaken competition, it is interesting to note that competition can be intense in a relatively concentrated market if existing players compete aggressively. This is the case in the Australian banking industry in which the Big Four dominate the market but they also compete aggressively with each other. For instance, the Big Four competed fiercely to offer lower rates in the Australian home lending market (Johnston, 2013). Although Bank A is a subsidiary of one of the Big Four, it does not compete with its parent bank because they attract different types of customers:

Our strategy is very much to compete with the regional banks, so we're a regional player. The types of people that are attracted to a regional bank are very different to the type of people that are attracted to a "big-four" bank. It's a very different mindset in terms of "I go to a big-four bank, I want that control, I want security, I want the safety". Whereas a regional player is a bit more dynamic, nimble, more competitive, you're going to get better pricing, you have to transact online, and it's quite a different mindset. There will be an element of overlap, but typically we are attractive to different people. (Senior Product Manager-A)

Bank A has a strong position in the banking market in State A, having been in this state for more than a century. However, the bank's position in the regional market had been challenged due to regulatory changes and intense competition. This resulted in restrained revenue growth as well as ongoing margin pressure. KPMG (2013) reported on the intense margin pressure in the Australian banking industry mainly due to strong competition for deposits in a low interest rate environment, where the difference between interest income gained from lending and the amount of interest paid out to attract deposits was tight. This competition was also partly influenced by the new liquidity requirements under the Basel III capital standards. As a result, Bank A had to differentiate its products and services through innovation to stay competitive in this challenging business environment. This is confirmed by a respondent:

What can we offer to our customers that other organizations don't have? One way is about innovative products, innovative services, but also innovative in the way that you interact with us as an organization. (Senior Manager of Architecture)

In conclusion, increased competition in a challenging business environment characterized by restrained revenue growth, ongoing margin pressure, and regulatory change has encouraged Bank A to pursue innovation by both improving efficiency and differentiating its products and services.

In the next section, the researcher investigates how customer demand influenced innovation at Bank A.

4.2.2   Customer demand

It has been noted that innovation initiatives within the Australian banking sector need to focus on meeting customer needs (Sainsbury, 2012) and Bank A was no different:

Innovation is usually driven through responding to gaps in customer needs. (Senior Product Manager-B)

The Big Four may not always have the appropriate levels of product or service attributes that the targeted customers particularly valued. For example, according to East and Partners' Business Banking Index, business customers (particularly small and medium enterprises [SMEs]) rated their banking relationships with the Big Four poorly and this therefore provided opportunities for smaller banks to cater for these customers (Efrat, 2015). Bank A tried to find the appropriate

combination of price and benefit levels that its financial products could offer to these targeted customer groups and other customer segments. This is in line with the proposal of Saviotti and Pyka (2013) that a product development team needs to consider the new product or service levels from the perspectives of quantity, quality and price that could potentially attract an adequate number of customers. As such, Bank A tried to develop new products or services that could meet customer needs in order to get positive responses from the customers. However, the introduction of a new financial product involves significant risks if a market for the offerings cannot be established, as illustrated by the following comment:

> *We launched a product called "Cashback". The credit card basically offered you cash back for certain spends. If you spent money in petrol stations, restaurants, on utility bills, we would actually give you money back, one percent cash back. That didn't perform particularly well, because it was a concept that was new to the Australian market.* (Senior Product Manager-B)

This finding is consistent with that of Roberts and Amit (2003) who found that banks in Australia tended to gain less benefits from innovations which were too different from the industry norm. It is very important to ensure that the proposed innovative solutions match the customer needs by involving lead customers in the development of new service innovation (Gustafsson, et al., 2012). Therefore, Bank A needs to involve lead customers to better understand its customer needs. Indeed, Alam (2011) proposes that the participating customers in service development in banks are preferably: (1) those customers with whom banks have a good relationship and who can be trusted; and (2) customers who provide innovative ideas.

In addition to new financial products, Bank A also had to differentiate its services to provide better customer satisfaction, as illustrated in the following comment:

> *Innovation doesn't necessarily have to be new products. It can be service. I think service is very important, so innovation can come through technology. As an example: with credit cards, within certain areas, say in the [capital city of State A] metro area, if you come into the particular store, we can give you your credit card on the same day. That would be an innovation. So, rather than having to wait for it to come through the mail with Australia Post, which can take five days, come into this store and we can give it to you today.* (Senior Product Manager-A)

Marabelli et al.'s study (2012) found that banks tended to focus on process innovation rather than product innovation because process innovation tends to be more inimitable by competitors and therefore more difficult to replicate. They also argued that most innovations in the banking industry were relatively easy to imitate because these innovations were largely not protected by patents. It would thus be difficult for banks to gain first mover advantage. For example, although Commonwealth bank's mobile application Kaching, a social payment application for Apple and Android smart phones, was first to market, it was outperformed by ANZ Bank's GoMoney application (Gluyas, 2014). As such, continuous process improvements in order to

offer better services for customers were required to stay competitive in the dynamic business environment.

To sum up, customer demand could trigger the need for innovation in Bank A but the bank had to understand what customers really needed to enable it to develop new financial products and services that meet their needs. However, innovative solutions are often difficult to create without technology, especially in the twenty-first century where most, if not all, organizations rely on information technology (IT) for processing their massive volumes of data. In the next section, the researcher investigates how development of technology influenced innovation at Bank A.

4.2.3   Development of technology

The development of IT has changed the way banks operate and has also altered the way customers perform their banking activities. For example, Berger (2003) demonstrates that the advancement of IT has improved the quality and variety of banking services, such as internet banking, electronic payment technologies, and information exchange technology for verifying loan applicant credibility. In Australia, contactless transactions, using "tap and go" with credit cards through payWave or PayPass, reached about 35 million a month in August 2013 (Bennet, 2013). Technological developments with greater internet access contributed to new financial products and process innovation (Cejnar, 2009; Roberts & Amit, 2003) and have changed a variety of business processes (Kirsch & Wailes, 2012). Technological changes have driven improvements in both banking services and profit efficiencies, especially for the major banks (Kirkwood & Nahm, 2006). Vermeulen (2004) suggests that most innovations in financial services enterprises are IT-enabled. This was supported by the results from the case study at Bank A:

> *If you think about innovation, underpinning all of that is our core banking technology. Absolutely, in terms of the financial product, you can't deliver that without IT.* (Head of Architecture)

In addition, according to a banking report in June 2013, 92.9 percent of residents in State A used online banking, higher than the national average of 88.6 percent. This reveals that online banking has become a necessity in conducting business in the Australian banking industry, specifically in State A. Therefore, Bank A needed to identify potential technologies that could be used to develop new financial products and leverage the existing business operations to provide better services for its customers.

To support technological-based innovation, Bank A required technologies that offered flexibility. Technologies like cloud computing and virtualization have enabled Bank A's application developers to offer alternative solutions to be implemented. Cloud computing with

its large pool of computing resources including services, applications, infrastructures, and platforms that are accessible via the internet can be beneficial in developing mobile technologies for better services, especially for smart phone users (A. Lin & Chen, 2012). However, companies are still cautious about the security and privacy issues of external cloud computing. In addition, application program interfaces and platform technologies of cloud computing lack standardization, and as such they reduce the interoperability among platforms offered by different cloud providers. Virtualization has also gained enormous attention among IT professionals with the rapid development of cloud computing technology providing multiple operating systems in a single server. It offers higher efficiencies in terms of the quantity of purchased servers, management and maintenance costs, and the consumption of electricity and cooling power (S.-H. Li, Yen, Hu, Lu, & Chiu, 2012). The need for cloud computing and virtualization to enable technological-based innovation has been recognized by Bank A and is confirmed by the following response:

> *When you start to talk about more of a cloud offering and you've got virtual services, virtual servers, a virtual infra-structure as a service and all those elements, they can really help facilitate. You may have a great idea and you go "Do you know what? I need to put a bit of software somewhere. Spin me up a virtual server, off I go, and then I can take it from that point, as opposed to the traditional model where "I need a new server. I need to procure it, I need to physically implement it somewhere." So a lot of that more scalable elastic infrastructure can really help facilitate innovation, because you don't need to wait for those traditional methods to do something.* (Head of Architecture)

Besides the actual technology itself, the approach to systems development can have an impact on technological-based innovation. The traditional monolithic approach to IT systems development has been criticized for being overly focused on process, tools and documentation at the expense of customer collaboration and responding to change. This approach could curtail innovation as it is predictive and requires detailed project planning for the future. Newer generation systems development methodologies that are adaptive to changing business requirements are more appropriate for the development of systems. One of these is the Agile methodology which prioritizes customer (user) satisfaction by delivering working software earlier and frequently (Williams, 2012). In such a methodology, agile teams, consisting of both developers and customers, need to communicate and collaborate intensively throughout the project since they learn about the system requirements as software development progresses (Chan & Thong, 2009). In situations where business requirements are rapidly changing, agile teams need to work together so as to maximize communication (Lindstrom & Jeffries, 2004). As such, agile development methods and the working environment for it were required by Bank A to pursue IT-enabled innovation to respond to rapidly changing business requirements.

In conclusion, technological pressures for innovation in Bank A were strong since online banking has become a necessity in conducting business in the Australian banking industry,

particularly in State A. The agile methodology, the associated working environment necessary for such methodology, and technology (such as cloud computing and virtualization) were relevant and were required to support the pursuit of IT-enabled innovation in Bank A.

While many banks have their own in-house technology development teams, a bank may need to work with strategic partners to deliver technological-based innovation. Banks may also need to work with strategic partners for other types of innovation. For Bank A, this need is examined in the next section.

4.2.4   Suppliers and strategic partners

As Bank A does not possess all of the different skills that are required for innovation it has to work with many strategic partners. The bank has collaborated with suppliers and strategic partners to pursue technological-based innovation, as illustrated in the following comment:

> *To advance technology, we collaborate with partner companies. We share ideas, we share our problems, and we ask for the helping in resolving those problems.* (Senior manager of Innovation)

Bank A also worked with several consulting companies to adopt administrative innovation, involving changes in organizational structure, administrative processes, and human resources. For example, a consulting firm was hired to review Bank A's employee incentive program and to develop a single and consistent program across the bank. Bank A also worked with a strategic partner to provide online credit card verification. In addition, Bank A also cooperated with a university in order to access economic research and to work with academia to deliver innovative solutions for customers.

In summary, suppliers and strategic partners have contributed to innovation in Bank A by providing cutting-edge technological support and new knowledge. In addition to having external partners, which could impact the Bank's innovation activities, government policy also had a hand in shaping the innovation at Bank A. This is explored in the next section.

4.2.5   Government or regulatory environment

According to Crooks (2013), the Australian financial services sector struggled to balance risk-aversion and regulatory-driven reliability and as such, innovation is required to stay competitive. As previously mentioned in Section 4.2.1, the implementation of Basel III regulations, for example, requires banks to increase their deposit ratio and this has partly contributed to an increased competition for deposits. This consequently forced Bank A to improve its efficiency and differentiate its products and services through innovation in order to stay competitive. However, regulation and bureaucracy were often viewed as inhibitors for innovation at Bank A:

I do not believe we will ever be as agile or as innovative as non-financial-sector institutions, simply because of the regulation and bureaucracy that comes with working in that sort of sector. (IT Specialist)

The financial industry is very regulated. There are multiple codes, whether they're voluntary or legislative that we are signed up to, that you need to ensure that you meet for innovating. (Senior Product Manager-B)

KPMG (2013) states that banks in Australia have continued to spend more on regulatory compliance in response to changes in both global and local regulation. Such need for compliance often requires significant resources which may deplete the needed resources required to generate innovation.

At the same time, reporting compliances could improve the banks' credibility by demonstrating good governance to accreditation bodies, such as APRA (Australian Prudent Regulation Authority). In some cases this could lead to process innovation to meet compliance. For example, in responding to the APRA accreditation process that was often complex and time consuming, Bank A was required to explore new software solutions which would enable it to provide the level of information that is needed to enhance its governance.

Bank A had to understand how each regulation influenced its business and how to address it. For example, Bank A reviewed how regulation affected its online credit card application process and tried to find a solution that would bring efficiency while still complying with regulation. Bank A was required to manage the risks of ensuring correct identification to meet Know Your Customer (KYC) requirements under the Anti-Money Laundering/Counter-Terrorism Financing (AML/CTF) legislation. Previously, the bank used to require its customers to complete an application online, print the document, and take it to the bank branch or the post office to have their identification verified. This had led to almost 65 per cent of potential customers failing to complete the application process. Subsequently, Bank A explored electronic verification solutions to eliminate the need for physical verification whilst meeting the strict requirements of AML/CTF legislation. Such opportunity then encouraged Bank A to collaborate with a strategic partner that provided solutions to eliminate the physical identity checks for its online credit card applications by verifying the personal identity information of customers against a number of comprehensive data sources.

In conclusion, regulations were often seen as inhibitors for innovation in Bank A since these regulations could limit the range of innovation that could be adopted. At the same time, regulations also require significant resources to be deployed which could otherwise be allocated for innovation. Nevertheless, these regulations could also promote innovation by stimulating competition, and in turn require higher efficiency. Regulations could also force banks to demonstrate good governance which consequently could encourage more process

improvements.

4.3 Four I framework

In the following section, the researcher investigates how the external context discussed above has affected the internal context of Bank A and how organizational learning in terms of the 4I framework supported the innovation at Bank A. Based on the literature, the researcher conceptualized the elements of Bank A's internal contexts as strategy, structure, organizational culture, and organizational resources.

4.3.1 Intuiting

In the phase of intuiting where new ideas are developed, the role of leadership was important in facilitating organizational learning and innovation at Bank A. The Chief Executive Officer (CEO) was credited as the source of entrepreneurial intuition (new knowledge with future orientation) as he promoted the value of innovation throughout Bank A and allocated the required resources and support for innovation, as illustrated in the following comment:

> *That comes from the top, so I think that comes from the CEO who does drive an innovative culture. And again it's not saying, "You've got permission to be innovative". It's like, "We want everybody, and we'll remove the roadblocks where it's appropriate, for you to be innovative".* (Senior Manager of Architecture)

The vision and strategy from the CEO guided the course of actions in innovation. The strategic vision is focused on delivering better services for customers by applying innovation and productivity, requiring the need for flexibility and efficiency. In addition, the CEO set four *strategic* priorities to respond to external challenges, as follows:

1. Customer relationships – to continuously search for new ways to better satisfy the customers;
2. Productivity – to continuously improve all aspects of the banking activities;
3. People and culture – to maximize employee potential and drive a "can do" innovative culture;
4. Sustainable growth – to grow the business in a risk aware and disciplined manner.

The CEO's strategic vision to deliver better services for customers through innovation and increased productivity provided a sense of purpose which inspired organizational members to develop new initiatives, as implied in the comments below:

> *So we'll identify problems and then look at actions to drive improvements which will potentially either increase productivity or provide a better customer experience.* (Senior Product Manager-A)

The source of ideas during the intuiting phase was not merely directed by top leadership but it was encouraged throughout the various levels of Bank A:

I guess the insight is driven from a couple of different levels. You've got grassroots innovation which happens amongst the everyday employees, who spot opportunities and try to do something about it. And then you've got more organizationally-driven innovation, so things that come from the top down, be it new systems for creating innovation ideas or new values or behaviors or KPIs that seek to drive innovation from the top down. (IT Specialist)

Apart from the commitment to innovation shown by the CEO, support for innovation could be found at different areas and lower-levels of management within the bank. More innovation activities could be found in areas where leaders were more open to innovation, supporting the findings of Johne & Harbone (2003) that bank leaders at different levels of management should provide support for innovation initiatives. This finding also supports the suggestion of Berson et al. (2006, p. 581) that "[i]ntuiting involves individual insight that may not occur in organizations without supportive leadership".

In order for new ideas to be generated, employees at all levels need to embrace creativity. This idea generation requires support particularly from middle managers to provide supportive internal contexts for facilitating knowledge creation (Saenz, Aramburu, & Rivera, 2007). For example, middle managers in Bank A need to have personal characteristics that welcome new innovative ideas and changes. They not only need to provide the autonomy for their employees but also need to create an environment of trust to support their employees in taking risks in innovative projects or processes. The importance of support from middle of management is highlighted in the following comment:

Middle management is probably where the biggest question mark lies. If you get a manager who is very open to innovation and trying new things, then that will be reflected in the efforts that their team have. If you get a manager who is not quite so open to change and is a bit concerned about what some of this innovation stuff might mean, then you'll obviously see less effort by their particular area and subordinates. (IT Specialist)

Research has however highlighted that role conflict, particularly for middle managers, can be an impediment to effective strategic formulation and implementation (Floyd & Lane, 2000). This is evident in the case of Bank A where some of Bank A's middle managers sometimes found it difficult to reconcile the conflicting interests between operating levels and top management. This was because ideas from lower level management could imply the need for flexibility or strategic change but directives from the top management provided control that guided activities to pursue a particular strategic position. There had been some leaders (innovation champions) who actively promoted innovation within the bank and channeled intuition from frontline employees to the top management, as illustrated in the comment below:

I think there are quite a few key players that have helped with innovative ideas or even helped further grow innovation within their area or within the bank. (Associate IT Specialist)

However, some leaders at lower level of management in Bank A were unable to communicate and negotiate the required flexibility to top management and they tended to ignore the operating managers' ideas for changes. As a result, bottom-up initiatives sometimes struggled to reach the top management at Bank A:

> *If you're not able to go through the right channels working from the grassroots up, it can be difficult to effect the innovation that you desire to. So you've got to deal with finding the appropriate people to channel those ideas through and to try and get the influence that's needed over the different sections of the organization.* (IT Specialist)

In daily operations, the operational level of organizations are more focused on operational issues as they have direct contact with customers and strategic partners. Initiating bottom-up initiatives could help the bank identify opportunities and threats on the shop floor immediately. As such, Bank A should not only rely on formal hierarchical channels to collect bottom-up initiatives but it also should provide other mechanisms to encourage staff at lower levels to put ideas forward without necessarily going through every hierarchical level.

To support the exploration of new bottom-up ideas in the intuiting phase, leaders at Bank A established the necessary *organizational structures*. Bank A initially assigned the Senior Manager of Innovation to develop and encourage a "can do" innovative culture within the organization and to develop innovative partnerships with other organizations including universities. One of the respondents mentioned that the Senior Manager of Innovation had played an important role in encouraging intuition and facilitating innovation at Bank A:

> *Previously also the [senior manager of innovation], he did some cool stuff as in helped with "Innovation Days" and that sort of stuff.* (Associate IT Specialist)

For example, the Senior Manager of Innovation conducted a two-day event specifically dedicated to innovation ("Innovation Days") which was held quarterly as a way to collect ideas and solutions from staff. This event facilitated people from different parts of the organization with different skills and specializations to collaborate in problem solving and in delivering business solutions. This is confirmed by the response below:

> *They have just implemented this new thing called Innovation Days, where anybody can put forward an idea. It's voted on by anyone in the organization, and then for one day, anyone that's interested, that wants to work on it as developers, they get a day off from what they normally are supposed to do and they try and come up with quick wins to fix faults or drive customers benefits.* (Senior Product Manager-B)

The Senior Manager of Innovation also implemented a framework called IDEA for managing innovation which included the following phases: "Imagination" or idea generation, "Design" or product specifications, "Evaluation" or feasibility studies, and "Action" or implementation. In this way, Bank A tried to reduce its bureaucracy to enhance the innovation process and motivate its members to put forward their ideas, as shown by the following comment:

We try to keep the process [of innovation] as informal as possible. In a previous life in the UK in a similar sort of role, we had a very formal process. You will submit your idea, a panel of 5 people will meet to review your idea, and the outcome will be a, b, or c but it was quite bureaucratic, and it sort of inhibited people to put an idea forward. (Senior Manager of Innovation)

In Bank A, the generation of new ideas or the intuiting process is often fostered through the use of information technologies that are quickly adopted in response to external changes. The IT function in Bank A essentially used agile methods as they are more adaptive and more suitable for developing systems with rapidly changing business requirements. Specifically, a senior director of the organization noted three major benefits for Bank A in adopting agile methods. Firstly, improvement in quality scope management because only the most required IT solutions were created, saving significant development costs. Secondly, agile methods enabled early identification of problems in the development stage. Lastly, agile methods improved engagement between developers and internal customers through highly collaborative approaches. As such, the adoption of agile methods in Bank A's IT function could provide the bank with flexibility and a quick-response advantage in developing new ideas to address changes in customer demand, challenges in the competitive environment as well as to strategically respond to any regulatory changes. This is demonstrated by the comment below:

A lot of the bank software is developed in house which give us very strong competitive advantage because we can change that software very quickly so typically every week there will be about 2 to 3 hundred changes to our software. (Senior Manager of Innovation)

The agile approach adopted by the IT function of Bank A was thus an example of how organizational structures and formal procedures were used to encourage and support ideas generated during the intuiting phase.

In addition to the adoption of agile methods, the IT function has been given some degree of autonomy in acquiring IT infrastructure by its parent company in order to enable it to pursue innovation. Nevertheless, IT-enabled innovation of Bank A is restricted to some extent by its parent company's IT infrastructure as it has to ensure integration of systems. For example, Bank A has had major developments in IT infrastructure to integrate its core banking platform. Thus common resources are centralized to enable resource sharing but specific resources are decentralized to enable Bank A to pursue IT-enabled innovation. The sense of autonomy in acquiring IT infrastructure facilitates intuition in pursuing IT-enabled innovation and was highlighted by the comment below:

It [the parent company's infrastructure investments] doesn't influence massively unless we view that it's mutually beneficial. Our bank can still be able to be innovative and be masters of our own destiny. If the parent company is investing in something that we think we could use, we could leverage that. (Senior Manager of Architecture)

Bank A has some levels of autonomy not only in the acquisition of IT infrastructure but also in the other areas, such as marketing strategies and interest pricing. This has allowed staff at Bank A to generate ideas to respond in a timely manner to the dynamic changes in the external environment.

Bank A also has created a dedicated function with a responsibility to explore opportunities in various market segments in order to encourage intuition in the development of new niche financial products:

> *We also have a Segment Business Development team now, that specifically looks at different segments of the market, to understand what their needs are. So we've got a team, one that looks after youth and migrants, then we've got homeowners or investors, another one is… like older people, like retirees, and we've got a team dedicated to small business segments that do the research and then work with us to develop the products and pricing.* (Senior Product Manager-A)

This dedicated function for exploring new customer segments could be associated with the bank's attempt to balance exploration and exploitation activities through a structural ambidexterity approach. This function could provide a space and resources for new niche financial products to be initiated.

While appropriate operating structures can facilitate organizational learning for innovation, a change in attitude and culture is also required to make banks more innovative (Johne & Harborne, 1985). In the intuiting phase, leaders at Bank A created an *organizational culture* or climate that stimulated the development of new ideas. These leaders encouraged organization members to think in new directions to promote more intuition, as shown in the following comment:

> *We drive the culture of think "outside the box". Think it as a different way in achieving things.* (Senior Manager of Innovation)

Leaders at Bank A also tried to build a "can do" innovative culture by creating a working environment that is conducive for innovation. As previously mentioned, the bank adopted the agile methodology that requires intense communication and good relationships between developers and users. As the agile teams need to be co-located, an activity-based working environment was adopted because it offers flexibility and mobility for the teams. According to Hirst (2011), activity-based working can offer advantages in terms of cost-savings, spatial flexibility, and promoting more interactions with other organization members and mobile networking. Staff do not have fixed desks but can work anywhere. In this IT-enabled working environment, every organization member is assigned a dedicated laptop that could be operated anywhere in the building with a staff-tracker application that can locate a colleague who is currently connecting his/her lap top to a particular docking station. When staff members need to brainstorm and meet in a more private setting, they can use a meeting room that can be booked

beforehand. The activity-based working environment facilitates interaction, idea exchange and collaboration and facilitated the intuiting process in Bank A. An internal survey revealed that the majority of staff was satisfied with the activity-based working environment and this is supported by the following comment:

> *The building itself has to be an absolute tick in the box for that, activity-based working. When we start to talk about more agile methodologies and agile ways of working, we effectively get people together who are looking to deliver something.* (Senior Manager of Architecture)

Observations of this activity-based working environment revealed informal dialogue and conversation among organization members that enabled the exchange of ideas and insights. In Bank A, differences of opinion were respected and organization members did not hesitate to express their ideas or challenge existing procedures. The organization's value of openness has also encouraged organization members to put their ideas forward, especially in the intuiting phase. This is confirmed by the responses below:

> *I would say culturally through encouraging people to always look for continuous improvements and ultimately freedom of speech, so people feel comfortable to actually come up with ideas. So I think it's fostering that culture of openness really.* (Senior Product Manager-A)

> *If anyone has a view or opinion, our culture allows you to speak up and put that forward.* (Senior Product Manager-B)

While respect and openness are particularly important to encourage organization members to express their novel ideas in the intuiting phase, it could also promote knowledge sharing required in the other 4I learning phases. Respect and openness not only fostered knowledge divergence in the idea generation process associated with the intuiting and interpreting phases but such respect and openness also facilitated knowledge integration required in the idea implementation process related to the integrating and institutionalizing phases. In other words, respect and openness not only encouraged organizational members to recognize and appreciate different opinions but also promoted the development of shared understanding by promoting the acceptance of new knowledge to be integrated into existing individuals' knowledge.

A knowledge sharing culture in Bank A is also enhanced with the use of the organization's internal corporate social networking application 'Yammer'. Yammer facilitates collaborative learning and problem solving. Individuals who have an innovative idea can post it on Yammer and try to convince other organization members to work together on the idea:

> *So I think the social aspect enables ideas to be bounced around much easier and I think from that, there is a huge amount of ideas that have come through Yammer from a colleague that was previously not connected to the developers or testers or infrastructure or any of the other managers from other areas. That inter-connectivity is very crucial.* (Associate IT Specialist)

As such, the use of Yammer could encourage staff in Bank A to express their ideas and insights as well as to exchange knowledge in the process of developing intuitive ideas.

The active staff participation in virtual communities was enhanced by the activity-based working environment in Bank A which facilitated more face-to-face interactions among staff and in turn fostered knowledge-based trust required for knowledge sharing. The exchange of knowledge among staff through both online and offline group discussions often resulted in the generation of new innovative ideas in the intuiting phase. In this way, collective interpreting during group discussions could stimulate individuals' intuition to come up with new ideas. This supports the argument of Berson et al. (2006) that the generation of exploratory ideas is closely linked to both entrepreneurial intuition and interpretation processes.

To facilitate intuition among staff in Bank A, senior leaders also incorporated new programs that enable staff to recognize each other's achievements and success stories as well as to celebrate team achievements. For instance, a program called "Heroes" in Bank A has been created to consolidate multiple incentive programs to become a universal recognition platform. The program also provided opportunities for employees to gain tangible rewards for their significant contributions to the company. An early study by Uthman (1997) has also highlighted that employees are also motivated to learn, innovate and improve their competences. Leaders can lead their organizational members "to find interest from the work and work for the sake of the work itself rather than the external rewards" (Tu & Lu, 2013, p. 451). The idea of intrinsic motivation is supported by the following comment:

> *What actually motivates you to innovate isn't actually that financial kind of reward, it's the ability to be able to open your mind and feel that you've delivered something really great.* (Senior manager of Architecture)

While several research findings have highlighted that financial incentives are not necessarily motivating employees and can have potential harmful effects by limiting employees' desire to innovate, an appropriate monetary incentive plan that tolerates early failure and rewards long-term success can however motivate innovation and lead to better performance than those without financial incentives (Ederer & Manso, 2013). In addition, Manso (2011) suggests that an organization can motivate its employees to explore new knowledge by developing an organizational culture that to some extent allows its employees to experiment and make mistakes. Not only is such a supportive culture critical, but the provision of timely feedback to employees is also needed to encourage more innovative work behavior.

To facilitate the intuiting process, Bank A has an innovative culture where staff (particularly in IT) were given time to do their own learning and projects that might not be necessarily related to their main tasks but might benefit the organization:

We've introduced things like innovation time out – it's pretty much like Google's "20% Time." So what we're saying is "look, you don't even need permission but if you're looking for it, you have it. If you come up with a great idea, we want to be able to support you to take that idea from that inception, that concept, through to let's commercialize it and then let's actually implement that idea and we will support and help you in doing so. (Senior Manager of Architecture)

Additionally, as previously mentioned, having a special program dedicated to innovation with less bureaucracy, such as "Innovation Days" could encourage staff to freely put forth their ideas. Through these programs, leaders specifically allocate more time for staff to participate in innovation activities so that ideas are not stifled by daily work:

The things that sort of work against collaboration is sort of sometimes pressures of work. You know, "I haven't got time to talk to you because I am so busy doing what I am actually doing", and so it's a constant challenge that sort of how can we free up more time for people to think and collaborate. (Senior Manager of Innovation)

This approach of allowing specific time for idea generation was particularly important to address a common problem found by Vermeulen (2004) where most staff in financial services firms are highly occupied with their daily activities and thus are not fully committed to innovation activities.

In addition to the organizational culture, the bank's *organizational resources* also influenced the intuiting process. In the case of Bank A, its specific organizational resources have constrained the range of innovation that could be adopted. For example, Bank A's existing technology platform investments could determine the type and range of software that could be developed to support innovation. Such software as part of the Bank's organizational resources can influence the intuiting process of new IT-enabled innovation:

So if the bank has purchased a new authentication platform, then we can start working with that authentication platform to find really cool ways of integrating it into our existing systems or taking it beyond its original capability in some really cool and nifty ways. On the flipside, if you, as an organization make your investments into one particular area, it often locks you into that particular area. (IT Specialist)

As such, Bank A had to invest in technology that could support innovation by providing the environment needed for agile development, such as cloud computing and virtualization (see Section 4.2.3). The adoption of cloud computing and virtualization is also an example of sequential ambidexterity where the first time they are adopted could be considered as exploration activities but the refinement of their use could be associated with exploitation activities.

In addition to the existing technology infrastructure, the cost for pursuing new innovation could also be prohibitive in stimulating new ideas in the intuiting phase. This is supported by the following comment:

Investment and infrastructure would absolutely facilitate change, but the cost that is associated with that can by default impede the change. Resource is considered as part of the decision-making. (Senior Product Manager-A)

Although resource constraints could impede the adoption of new technology, to some extent limited resources could also promote process improvements to achieve higher efficiency. For instance, the need for improved efficiency had pushed Bank A to change its call center to a national virtual contact center by adopting IT-enabled innovation. Since Bank A did not have the complete set of knowledge and skills to deliver various IT-enabled innovation, it often collaborated with external partners in the adoption of new advanced technology (see Section 4.2.4).

To sum up, the top leaders of Bank A played a significant role in the intuiting process by inspiring their members to develop innovative ideas through the provision of vision and strategic direction. They have also shown their commitment to innovation by providing support and resources. These leaders strived to encourage every member of the bank to express their ideas and work collaboratively to deliver the best solutions for improving customer satisfaction at Bank A. As such, intuitive ideas could also come from lower levels of the organization where frontline employees identified the need for new financial products or improved business processes. Because intuitive ideas from lower levels of the organization often struggled to reach the top management, leaders of Bank A provided more channels for gathering bottom-up initiatives through structural arrangements, such as providing opportunities for organizational members to put ideas forward through "Innovation Days". The bank also had a dedicated function to explore new opportunities in new customer segments and this was an example of the bank's endeavor to balance exploration and exploitation activities through a structural ambidexterity approach. In addition, leaders of Bank A strived to create an organizational culture or climate that encouraged staff to put forth their ideas and insights i.e. being open to new ideas and respecting and rewarding different insights. These leaders also tried to support intuition for IT-enabled innovation by adopting technology that could provide an environment needed for agile development, such as cloud computing and virtualization. The adoption of new technology could be considered as exploration activities but the refinement of its use could be regarded as exploitation activities. This is also an example of the bank's efforts in achieving organizational ambidexterity through a sequential approach.

In the following section, the researcher examines the interpreting phase of 4I organizational learning at Bank A.

4.3.2   Interpreting

While intuition, idea generation or new learning is associated with individuals, leaders are often responsible for setting the context in which new ideas are interpreted so that they can be

meaningful and be acted upon (Berson et al., 2006; Crossan et al., 1999). In the interpreting phase, strategic leaders in Bank A played a very important role in providing the context of interpretation of ideas by using the bank's strategic direction. Bank A's senior management viewed innovation as a necessity to be competitive.

According to KPMG (2013), the challenging environment in the Australian financial industry, characterized by slower market growth, increased competition in a lower interest rate environment and regulatory changes, had forced many banks (including Bank A) to operate very efficiently to enable them to deliver competitive rates and in turn achieve profitability (see Section 4.2.1). However, Bank A found it difficult to compete merely based on lower cost and the bank was required to innovate by differentiating its services in order to compete in this challenging business environment. As such, Bank A had to pursue both a cost-leadership and a differentiation strategy simultaneously. In addition, the advancement of IT required the bank to adopt new technology in innovative ways to meet customer demand (Section 4.2.2 and 4.2.3) while still needing to comply with regulations (Section 4.2.5). This was the context within which strategy was used to interpret ideas.

The Chief Executive Officer (CEO) set an overarching vision and high-level *strategies* as a source of developing a shared interpretation that guided innovation activities. The vision and strategies have encouraged the members of Bank A to find novel initiatives to achieve the organization's strategic goals, as shown in the comment below:

> *They've set some quite high aspirations as a bank to be a better bank for the customers. I think that then leads people within a constrained set of resources to come up with better ways to do things, whether that's better processes, better technology, or anything like that.* (Associate IT Specialist)

The senior management consistently communicated and demonstrated its commitment to innovation. Language plays a pivotal role in the process of collective interpreting (Crossan, et al., 1999). It enables the development of a common shared understanding for interpretation of new ideas. Common language used in dialogues and conversations among organizational members allows vision to be more concrete which can then be acted upon. As noted by a senior level management participant in the bank, analogies are used when communicating complex and unfamiliar concepts so that others could understand them more easily. This confirms the notion of Berson et al. (2006, p.583) that "[b]y using metaphors leaders could allow their followers to frame the contribution of their learning and align it with the goals of the organization". The senior management's choice of narratives and language consistently sent the message of the necessity of innovation in order to be competitive. This is demonstrated in the following comment:

If you've got a great idea, let's give you the time and opportunity to do something with it. I think you see that not only in the behavior but also in the language that comes down from leadership. (Senior Manager of Architecture)

Leaders at different levels of management communicated the vision and strategies down through the hierarchy to facilitate the development of a shared interpretation of new intuitive ideas. For example, the vision of innovation has been translated into IT strategies by the Chief Information Officer (CIO), including the adoption of agile methods and a "can do" innovative culture for delivering better customer services. To face the challenging business environment, Bank A strived to increase efficiency but at the same time introduced niche financial products through the pursuit of IT-enabled innovation to remain competitive.

In order to guide new thoughts and interpretations among existing employees, Bank A either introduced new *organizational structures* or even restructured the organization with top managers being rotated or by appointing external people to introduce new changes. For instance, the CIO brought in a new person to the IT function to obtain new perspectives and therefore new interpretations related to the agile methods, as implied by a respondent:

I think definitely the management changes recently, for example [a new person] coming over from the "Lonely Planet" who's very strong in the agile space, he's been heavily pushing agile and encouraging and facilitating innovation and he's been very fundamental in helping change that. (Associate IT Specialist)

This change helped the bank push the adoption of agile methods in the organization. In addition, leaders of Bank A also introduced new programs i.e. "Innovation Days" to infuse new interpretations related to the need for innovation.

The process of interpreting involves developing meaning and shared understanding among employees. The shared interpretation of the need for differentiation also prompted the senior management to continuously formulate and implement strategies to differentiate its financial products in order to be competitive. Bank A needed to continuously explore new ways to provide better services for its customers. As such, top leaders ensured that all employees are customer-focused. For instance, through the Heroes program, top leaders of Bank A strengthened a "can do" innovative *culture* by fostering a culture of recognition among Bank A staff and continuous learning for innovation in order to satisfy its customers. Bank A's leaders used its reward and recognition structures to set the context for the interpretation of ideas by its staff. The reward and recognition structures would be effective in motivating individual staff to put their intuitive ideas forward when they understood that new ideas enabled innovative outcomes and the possibility of better performance of the overall organization.

The interpretation of meaning and mental models among employees is also facilitated through the interaction and conversation among staff, particularly with the use of the activity-based

working environment and "Yammer" in Bank A. Observation of this activity-based environment showed that organization members often used task or role-related jargon or common language understood only within the community. Members from different areas of the bank could have different sub organizational cultures with different sets of values, norms, and practices and thus they often interpreted new knowledge differently. To some extent, such task-related diversity in information, knowledge, and perspectives could stimulate creativity within the bank. For example, members from different functions could collaborate to develop innovation initiatives, as mentioned by a respondent:

> *So my role is to drive sales. If part of my strategy to drive more sales is through product innovation, then I will put forward an idea on product innovation…We would be the initiator and then we would go and talk to IT to see what development is required and what costs are involved.* (Senior Product Manager A)

However, such task-related diversity could also impede collaboration since members from different functions like the technical and non-technical members at Bank A often had different thoughts and opinions about the need for and urgency of innovation, as shown in the comment below:

> *Sometimes the other sides of the fence are other areas, which are not so technically inclined, are in a more static way of doing things. They're not as quick to move to or adopt new ways of doing things such as agile.* (Associate IT Specialist)

Staff who had an intuitive idea should be able to communicate his or her idea and convince the other members to work together on the idea in the phase of interpreting so that the idea could be acted upon. While Yammer could assist the bank members to express their ideas easier by posting them on Yammer, it would not be translated into actions unless the other members supported the ideas to be implemented, as implied in the following comment:

> "*What you don't want it [Yammer] to be is a backlog of ideas*". (Senior Manager of Architecture)

In the interpreting phase, *organizational resources* also influenced how the bank members interpreted opportunities for innovation, as indicated by a respondent:

> *We only have a limited FTE [the number of personnel]. If it's too costly, then we can't do it. We need to decide if this is something we want to do, do we have the right resources to deliver against it?* (Senior Product Manager-A)

Thus, although ideas may be generated during the intuition phase at Bank A, resource availability was one of the interpretations used to determine if they could progress beyond the idea phase. For example, the inflexibility of IT legacy systems at Bank A, which often hindered the adoption of exploratory technological-based innovation, was an additional lens within which staff interpreted their ideas.

Various changes in the external environment i.e. customer demand, competition, and regulatory environment, require organizational members to interpret such changes and develop new initiatives to respond to these external factors. The interpretations of organizational members require the whole organization to be agile, particularly with respect to IT-enabled innovation which is critical for the success of the business. Business requirements may evolve due to changes in external environments and the changes from the initial plan can have consequences on the budget required to build the system. Similarly, in terms of budgeting, agile developers were frequently unable to provide the exact amount of the required budget to develop a system up front. As opposed to the waterfall development methodology, agile development teams do not know exactly what the final system would look like in the beginning of development, and thereby they adjust the system requirements frequently throughout the development process as suggested by Chan and Tong (2009). Thus while on the one hand, new ideas in terms of IT development could be interpreted in the context of an underlying agile methodology, the traditional fixed-funding methods could counteract any moves to be agile and therefore innovative, and this is something that Bank A needs to address:

> *Budgeting is a huge thing. You can have all the continuous integration tools that you want, but if you're still prioritizing and planning in one, two, three-year blocks at a top level as an organization in terms of what you're funding, then you can't really call yourself agile.* (IT Specialist)

Cao et al. (2013) propose that the funding process for agile IT projects need to be adapted to consider the evolving scope, cost, and schedule for delivering the projects. Firms need to relax the budget by tolerating the excess costs to a certain degree. However, when firms have fixed budgets, they need to relax the project scope to allow for the agreed changes.

In other instances, the perceived strong pressures for increased efficiency and productivity have partly contributed to the structural changes and affected resource allocation within Bank A. As mentioned previously, Bank A established the Senior Manager of Innovation position to build a "can do" innovative culture, however the position was scrapped in 2013 after the researcher completed the primary data collection for this case. The Chief Information Officer (CIO) no longer believed that a specific area or position was required to facilitate such a culture but instead that innovation values needed to be developed bottom-up by broader organization members. Innovation should be seen as every organization member's responsibility, as confirmed by a respondent:

> *I think it [innovation] really needs to be embedded in the culture to make sure that it's on everyone's agenda.* (Senior Product Manager-A)

As a result, although the Senior Manager of Innovation had contributed significantly in fostering an organizational culture that was conducive for innovation, Bank A no longer had a specific

area or position that focused on innovation. Some tasks that used to be performed by the Senior Manager of Innovation (such as organizing "Innovation Days") were taken over by the Enterprise Services (IT) function. Furthermore, the bank has also eliminated the "Innovation Time Out". Within this research, it is too early to determine the effects of this changed structure on innovation levels at Bank A or on its culture.

Overall, the senior management of Bank A consistently communicated the interpretations of the bank's vision and strategic priorities to its staff. These leaders guided the members' attention to focus on efficiency and the provision of better customer services through innovation. Leaders of Bank A used organizational structures to facilitate collective interpreting i.e. the appointment of new personnel to bring in new interpretations. These leaders also created an organizational culture or climate to support knowledge sharing required for collective interpreting, such as the activity-based working environment and Innovation Days. In the intuiting and interpreting phases, leaders of Bank A strived to create a working environment that was conducive for expressing different ideas and insights i.e. openness and respect to promote more varieties of intuitive initiatives which can lead to exploratory innovation. However, due to different functional perspectives, it was often difficult to achieve a shared interpretation among the bank members. In addition, resource limitation forced the bank's leaders to prioritize and interpret the feasibility of new initiatives within this resource-constrained context. This resulted in tensions between various parts of the organization where the members of different functional departments perceived their objectives to be incongruent with that of other departments. This often led to conflicts of priorities and competition for resources, posing challenges to the integration process.

In the next section, the researcher investigates the integrating phase of 4I organizational learning at Bank A.

4.3.3 Integrating

While the interpreting phase is about setting the context within which individuals frame their ideas, the integrating phase is where shared understanding of the ideas is achieved by the group (Crossan et al, 1999). Berson et al. (2006) view the integration of learning in an organization as the responsibility of its leaders. In the integrating phase of organizational learning at Bank A, leaders played a significant role in integrating the different views among organizational members for translation into a collective action. Leaders in Bank A communicated a strong vision of customer-centricity and productivity as well as its strategic priorities and they aimed to achieve a shared understanding of the context within which innovated ideas should be interpreted:

We now have a very clear vision that the whole organization buys into. So that's actually assisting in getting better teamwork and better at working together. (Senior Product Manager-B)

Well, any decision that is made needs to relate back to the overall strategy and ultimately the impact that it's going to have on either a core value or that customer experience or profitable growth or productivity. (Senior Product Manager-A)

This finding is consistent with Berson et al.'s (2006) view that leaders need to build and strengthen the vision and culture of the organization to integrate learning.

Leaders at Bank A not only had to communicate the reason for changes but they also highlighted how innovation would affect business processes, and conveyed the potential benefits of innovation to all organization members particularly to those who were directly affected by the changes. In this way, leaders tried to minimize the resistance to change from organization members. Indeed, some new initiatives were often resisted because these initiatives challenged the established routines or procedures:

It might be that there are more senior people in the organization who own a process which has worked the same way for a good portion of the time and there's fear of what change might mean to that process or that person. (IT Specialist)

When new initiatives involved significant changes and affected many staff from different functions and levels of management, the integration process was difficult to achieve because the changes would need to be discussed to gain consensus from key organization members. In achieving integration, staff at Bank A also often chose a route that minimized conflict. This is supported by the following comment:

It's generally by finding the people closest to the team or somehow related to the process that you want to innovate or change somehow, and influencing them and working with them to allay their fears and to find out from them, with their better knowledge of the processes or systems that you might wish to change, how best that change can be implemented without impacting colleagues or systems in a negative way. (IT Specialist)

As such, mutual understanding was needed to discuss various issues or conflicts to achieve a certain coherence of actions for the purpose of integration (Crossan, et al., 1999).

In addition, a more central role of middle managers was required to resolve the often contradictory aspects of the visionary and abstract concepts of top management, and the more concrete experience-grounded concepts of frontline employees (Nonaka, 1988). Although there had been middle managers who acted as innovation champions in facilitating innovation, some middle managers of Bank A still found it difficult to reconcile the tension between top management's strategic directives and bottom-up initiatives which often manifested in the contradiction between exploitation and exploration.

While theoretically leaders should be able to integrate exploitation and exploration, exploratory innovation at Bank A was often constrained by some managers' less risk-tolerant behaviors:

> *They support it, but the reality is that getting things done, making sure things keep ticking over, is sometimes done at the expense of innovation.* (Senior Product Manager-B)

This is consistent with previous studies which found that many managers in financial services institutions showed risk-averse behaviors (e.g. Vermeulen, 2004). To some extent, managers at Bank A were constrained by the need to meet operational KPIs (Key Performance Indicators). As a result, they tended to exploit existing strategies rather than explore new strategies for innovation, thereby resulting in more exploitative innovation.

In addition, the slower market growth, increased competition, and regulatory changes in the Australian banking industry required Bank A to operate efficiently (see Section 4.2.1). The shareholders also seemed to value bank efficiency as indicated by the positive correlations between bank efficiency and bank stock returns (Shamsuddin & Xiang, 2012). In other words, increased efficiency which could yield greater profitability was of the greatest interest to shareholders. This has pushed Bank A leaders' *strategic* decisions towards efficiency and process innovations that were mostly exploitative, as implied in the following comment:

> *We're always going to be challenged to improve our cost to income ratio and one of the easy ways to do that is through cost cutting, it's quite often through retail – cost cutting – but ultimately there's a risk with that because if you then don't have the resource to support the growth of the business... it's kind of a balancing act really.* (Senior Product Manager-A)

Since the pressures for increased efficiency and productivity for greater financial benefits were relatively strong, leaders at Bank A often overemphasized short-term financial gains over long-term financial benefits. This could then affect the organization's capability to reconcile the tension between exploitation and exploration, as mentioned in the comment below:

> *I think we need to have more of a focus on service because ultimately strong service is what gets you customers, but it's very, very hard to put a monetary value on service. Or you might identify systems improvements that you think are going to improve the customer experience, but they don't always get prioritized because the financial value's hard to demonstrate. So I think that's where forward-thinking organizations probably really have the customer at the core, which in the long run, will probably have a strong financial impact. If you take too much of a short term view, then it can impede I guess.* (Senior Product Manager B)

While it is understandable that an organization may need to pursue efficiency and short-term financial gains to survive in a resource-constrained environment, to some extent leaders should also allow the pursuit of exploratory initiatives with longer-term financial benefits. An organization needs to balance exploration and exploitation, with exploitation providing the resources needed for pursuing exploration and conversely exploration enabling the development

of new capability to be exploited to avoid rigidity (Levinthal & March, 1993; March, 1991). As such, an organization has to pursue both cost-leadership and differentiation strategies simultaneously as suggested by Santos-Vijande et al. (2012). In the case of Bank A, it strived to differentiate its financial products for new niche markets and improve its efficiency through IT-enabled innovation. In this way, Bank A tried to balance the tension between exploration and exploitation activities.

The senior management team of the bank also had to consider risk assessment carefully before undertaking the pursuit of exploratory and exploitative innovation. The bank's exposure to various risks required the integration of understanding of all employees that they needed to be aware of the role of risk management in promoting prudent behavior of banks. The risk management framework of the bank guided the implementation of any proposed changes and ensured that the potential risks of strategic innovation initiatives were carefully thought about before any implementation. This is illustrated by the following response:

> *We have a risk management framework that covers all of our change initiatives. Each initiative is rated, it's given a risk score, and from there a decision is made whether or not the business will accept if there's any individual risk, accept those individual risks. And if so, then it will proceed.* (Senior Product Manager-A)

As such, leaders needed to have ambidextrous behaviors, to be able to pursue both exploration and exploitation (Mom, et al., 2009). Risk-averse behaviors among leaders could be minimized if they were provided with more complete information related to calculated risks and how these risks could be mitigated. Risks should not be seen as inhibitors for innovation. Effective risk management will help the senior management team prioritize strategic resource allocation in the pursuit of both exploration and exploitation activities. At Bank A, a dedicated risk management function headed by a Chief Risk Officer is tasked to ensure effective risk management within the organization. Nevertheless, in this study, the researcher did not investigate risk management in Bank A in greater detail.

In terms of *organizational structures*, Bank A had structures that encouraged the integration of learning. Leaders at Bank A conducted frequent formal meetings to facilitate communications through dialogues within and between groups from different levels of management. This enabled the development of shared understanding to reduce the challenges of differing interpretations:

> *There's different layers, there's board meetings, I think there's six-monthly meetings with the parent company board, there's monthly executive leadership team meetings, there's weekly sales and service meetings, like different lines of the business, so the business, the retail, the CEO has one at his level, so they are extremely regular.* (Senior Product Manager-B)

The formal meetings at the executive level were particularly important because they facilitated conversation, knowledge-exchange, and collaboration among the senior management team which in turn enabled the reconciliation of conflicting objectives across spatially distributed units undertaking exploration and exploitation activities. As such, the strategic decisions regarding front-line service were centralized in the headquarters since Bank A wanted to ensure a consistent approach to its customers:

> *Branches don't have decision-making in the strategy. It's centralized.* (Senior Product Manager-B)

The bank's work structure was highly regulated so that it required employees to perform their tasks and represent themselves to customers in a consistent manner. However, it does not mean that senior leaders at Bank A disregarded input from lower levels of management. Indeed, these leaders recognized bottom-up initiatives which suggested, for example, the need for having different strategic approaches between spatially distributed units in eastern and western parts of Australia. Such integration of structures and communication manifested in the pursuit of exploration and exploitation by the Bank to respond to differing external market positioning in different regional areas. As a challenger brand in the eastern part of Australia, Bank A explored new marketing strategies for targeting new customers who were different from those in the western part of Australia. This is supported by the following comment:

> *We have a different overall strategy for east and west, so in [western parts of Australia] it's all about building our brand within the community and having that real community focus, whereas on the east coast we're positioned as a challenger brand. We're really competing against the regional banks, so slightly different type of customer because we don't have the heritage, so people are typically financially more savvy. And I guess that's been decided through analysis of who we've attracted to the brand, as to who we'll actually target.* (Senior Product Manager-A)

In other instances, cross-functional team members in the development of new financial products have also assisted the integration between existing and new learning at Bank A and in turn improved coordination between functions since members could move back and forth between the roles of temporary project team member and a member of a function. In other words, such integration mechanisms can provide horizontal linkages between exploratory and exploitative activities which can result in enhanced coordination (Jansen, Tempelaar, et al., 2009). Successful new product development in the banking industry requires good internal cooperation and coordination between different functions involved in the development process (Johne & Harborne, 1985). Harmonious cross-functional interfaces are critical to facilitate learning during the process of new financial service innovation (Blazevic & Lievens, 2004).

Leaders at Bank A also facilitated formal meetings between the groups to encourage dialogues among members across different units so that they could share knowledge and achieve a shared understanding. This is supported by the comment below:

> *The change that we've been doing is the meet-ups in [the capital city of State A]... technical and non-technical meet-ups. So because we facilitate those meetings, it helps to encourage the two sides that were previously divided, to come together.* (Associate IT Specialist)

Boerner et al. (2012) are of the opinion that an organization must have frequent formal meetings because these meetings can promote high levels of team identity which in turn facilitate the integration of knowledge and understanding. In addition, leaders of Bank A empowered staff to solve their conflicts within the domain level through rational discussions, and to prioritize such that the most reasonable and feasible options were chosen. When a conflict could not be resolved at the domain level, the decisions could then be made at the organizational level.

In addition to organizational structures, *organizational culture* also influences the integration process of 4I organizational learning. Leaders should create an organizational culture or climate that encourages the integration of learning. As mentioned earlier in the interpreting phase, the diversity in functional perspectives could impede collaboration. Different functional perspectives could even have led to a silo mentality, as illustrated in the following response:

> *Depending on the area of the organization that you work in though, there are still some very ingrained cultural practices and behaviors amongst individuals or teams that have traditionally operated in a very siloed model, separate from the rest of the organization.* (IT Specialist)

The culture of "working in a silo" could be caused by the nature of departmentalized structures in financial services organizations as evidenced in Vermeulen's (2004) study. From a 4I perspective, such a silo mentality could threaten the development of shared interpretation and the integration process. As such, leaders at Bank A consistently and repetitively communicated a customer-focused and productivity vision to all levels of staff by fostering a "can do" innovative culture in order to promote integration. According to Wang & Rafiq (2014), a shared vision provides a sense of direction that promotes the harmony of interests, alleviates opportunistic behavior and facilitates the integration of an entire organization. While in the intuiting and interpreting phases, leaders of Bank A encouraged their members to have different ideas, in the integrating and institutionalizing phases, leaders promoted the integration of views for a shared understanding and encouraged their members to work together to achieve the bank's ultimate goals. As such, Bank A strived to balance the tension between exploration of new knowledge and exploitation of existing knowledge through the development of an ambidextrous organizational culture (consisting of organizational task-related diversity and shared vision) that led to contextual ambidexterity.

In the integrating phase, leaders also had to consider *organizational resources* to make decisions related to the pursuit of innovation. The need for improved efficiency and the availability of supporting technology have encouraged Bank A to pursue technological-based innovation. For example, as mentioned earlier, Bank A changed its call center to a national virtual contact center by adopting IT-enabled innovation. This approach has increased efficiency by channeling the calls to staff in any location rather than centralizing these calls into one call center. In this way, Bank A was able to close a 140-seat telephone call center within six months and improve customer service levels at the same time:

> *What we've done is to move the call to the colleague. If you work in [a remote area in State A] but don't have any customer, we can send calls to you. Customers can have a better service because they talk with someone who has got 15 years experience rather than 2 months experience in the contact center. And you are involved in filling a role because rather than sitting with nothing to do in [a remote area in State A] you've got a customer to talk to you. And the cost for the organization goes down because we don't need the big call center in [capital city A].* (Senior Manager of Innovation)

While the initiative to change its call center to a national virtual contact center focused on efficiency, which is associated with exploitation, this initiative could also be considered as exploratory innovation because it involved significant changes to existing business processes in the call center area at Bank A.

Because Bank A had finite resources, leaders had to select the most reasonable and feasible initiatives in response to the external environment and the availability of resources:

> *It's the sensible decision about which is the bigger benefit, and if the benefits are the same which is the quickest one for us to do? We do expect some of that empowered thinking to happen in that "You know we can't do both of these, we're going to have to make a decision to do that first and then defer that one". And then we will tell people, who are interested, "That's why we've made the decision".* (Senior Manager of Architecture)

Organizational resources could be constrained by the number, availability, and cost so that the implementation of innovative ideas needed a trade-off in resource allocation. This is confirmed by the following response:

> *One is resource. One is cost. Some are like our current infrastructure, so you're never running on systems that have been around for thirty years. Some things are possible and some things are layered and layered and layered over other things, that it's really difficult so what you think is a small change or innovation is actually quite complex to get done.* (Senior Product Manager-B)

Another challenge of integrating organizational learning in Bank A was the tension between continuity and change within IT-related departments. When software developers wanted to make changes, they had to consider the security and stability of the systems. This reflected the

external context in the industry of having to balance risk-aversion and regulatory-driven reliability with being innovatively competitive:

> *So I think the tensions are possibly between security and development ...also from the developers to the infrastructure guys. Infrastructure has to ensure that the systems are up theoretically a hundred percent of the time as much as they can. And then developers are actually up to try and make changes and changes almost by definition is going to change that, change possibly how stable the system is because you're adding more code.* (Associate IT Specialist)

In addition, in response to the external factor of technology changes, Bank A had to undertake collaborative decisions in order to support innovation. Such collaborations enabled the integration of views and ideas for innovative technological-based solutions. In the case of Bank A, there were many collaborations across different functions or sections. Technology investments were made based on collaborative decisions to reflect the need of different functions or sections because the investment in particular technology platforms could possibly impede innovation. The chosen technology platforms influence the sort of working software that could be developed to support innovation. As such, Bank A invested in new technology like "TeamCity' and ACDC that could facilitate the adoption of technological-based innovation by providing the environment needed for agile development:

> *Servers like TeamCity which allows you to automatically build solutions. A large amount of money and time's been invested towards ACDC (application, continuation, deployment, configuration) where you can essentially build a set from bare metal, so from absolutely nothing to full application. So that helps developers know that they're at a target state, and also infrastructure know that they're at a target state, so that would definitely remove the tensions and encourage interaction so that the developers can help the infrastructure know what's happening and the infrastructure had a complete log, so it's more teamwork I suppose. Those would probably be the two biggest tools.* (Associate IT Specialist)

Overall, Bank A had a relatively high level of integration of its organizational learning which enabled it to implement changes or innovation. Leaders at Bank A used strategic vision and priorities to integrate intuitive ideas and encourage staff to work together as a team to achieve the organization's goals. Leaders used organizational structures and formal procedures to create an internal context that stimulated integration through dialogues and conversation among staff. For instance, the bank had formal meetings at different levels of management and facilitated conversation among staff across different units so that they could share the learning and achieve shared understanding. Leaders also fostered a "can do" innovative culture which ensured all employees were customer-focused to promote integration. Since Bank A had finite resources, leaders had to prioritize initiatives that were aligned with the organization's strategic objectives and those that potentially offer the most economical benefits. In a resource-constrained environment, leaders of Bank A often prioritized the pursuit of IT-enabled innovation which

could improve efficiency and save costs. However, Bank A also tried to differentiate its services in an attempt to balance the tension between exploitation and exploration activities.

In the following section, the researcher examines the institutionalizing phase of 4I organizational learning at Bank A.

4.3.4 Institutionalizing

In the institutionalizing phase, leaders need to make knowledge available for exploitation and this involves embedding new learning into systems, structures, strategy, routines, and investments in information systems and infrastructures of the organization. At Bank A, once innovative solutions were specified and had approval and funding, the solutions were implemented. Some innovations at Bank A were undertaken as projects that were approved by its leaders. Project managers were appointed to carry out the innovation projects. They tried to deliver the specified innovation work that needed to be done within the agreed time and cost. They worked with stakeholders to meet project goals. These stakeholders included people who were involved in or affected by project activities, such as customers, end-users, project teams, and executives as project sponsors. These activities required good project management:

> *So then you have the project governance that comes around that [innovation], so you have a project manager, you work out the financials, you've got a budget to work towards, and you work within that constraint to get that through to implementation.* (Head of Architecture)

Previous studies have suggested the importance of leadership for project success (e.g. Muller & Turner, 2010; L.-R. Yang, Huang, & Wu, 2011). Muller and Turner (2010) argue that the most successful organizational change projects and information and telecommunication technology projects have project managers with good communication skills. Similarly, a respondent at Bank A also mentioned that project leaders needed to have good communication skills:

> *Well typically that would be run by projects, so we've got project managers that run that and engage all the right people. So I think it's more having that central coordinator to coordinate a big project like that and make sure all the right stakeholders are engaged and then that communication is really key to the end-user, be that colleagues or customers. So I think it's communication and stakeholder collaboration.* (Senior Product Manager-A)

Project leaders had to communicate with relevant internal stakeholders any new changes or innovation to obtain feedback for further implementation of changes. For instance, these leaders tried to identify barriers to implementation and provided support to overcome these problems in the institutionalizing phase, as implied in the comment below:

> *You don't, from a frontline colleague perspective, expect them to take on so much change that it's really unmanageable, and they get into a state and a situation which is*

> *"I don't know what to do with this new product. You've already put this on me. I've got training to do over here," etc, etc.* (Head of Architecture)

From the above it appears that at Bank A, leadership and project management played a big role in institutionalizing new learning.

In addition, leaders of Bank A had to communicate new structural changes to relevant areas more effectively to improve coordination in the phase of institutionalization, as implied in the following comment:

> *I guess what's been quite prevalent of late is that we've had quite a few re-structures within the organization to improve our profitability and improve our cost to income ratio to make us more productive. As a result of that, it can be quite hard to know who to talk to because people keep changing roles and jobs, so that can quite often delay things because it may take a week to find the right person to talk to.* (Senior Product Manager-A)

They also needed to feedback the institutionalized learning through more participative activities like meetings and trainings because not everyone in Bank A was actively using "Yammer" as a means of communication, as illustrated in the comment below:

> *And quite often things will go viral and get communicated on Yammer but I don't have time to look on Yammer. Then, things can come out on Yammer and get a bit out of control before you know about it. You have to rein it back in and answer the question and then look if there's someone in the team who occasionally does look at it. But we don't have capacity to sit and monitor and respond to the questions.* (Senior Product Manager-A)

From a *strategic* point of view, leaders assigned organization members responsibility for institutionalizing changes or innovation plans or if necessary created a new structure for this responsibility:

> *If it's coming from the top down, then generally it's something that's cascaded through management, either through performance objectives or through the creation of a new job function or section within the organization, specifically dedicated to [new] innovation.* (IT Specialist)

Changes in the external environment could influence the institutionalizing process and organizational leaders are required to adjust their innovation strategies to respond to changing external contexts. Bank A leaders' strategy was to pursue IT-enabled innovation to improve efficiency and offer new financial products in order to gain a strategic advantage in the competitive environment by being customer-centric. One example of an innovative service offered by the bank is the launch of the Express Stores in 2011. These interactive kiosks deliver greater accessibility and convenience for customers since they are located in shopping centers and provide the functionality of a regular bank. This includes an ATM, free internet access and

all the services customers expect of a regular bank. A customer service representative is also available to assist at the kiosks seven days a week, including late night Thursday and Friday. This Express Stores concept can be considered as exploration because it is the first of its kind in State A. In addition, Bank A tried to offer competitive rates and personalize its home loans to attract more customers. It appears that using both cost-leadership and differentiation strategies to institutionalize the new learning vis-à-vis customer-centricity has resulted in strong financial results for Bank A particularly in its retail business.

The vision of being customer-focused was also reflected in Bank A's commercial banking, where it was awarded Business Bank of the Year 2013 and 2014 by Smart Investor Magazine. This award was for a bank that could serve business owners with competitive deposits, credit cards, and lending solutions which suited their needs. Bank A also provided tools, information, products, and specialists to help SMEs to start, manage and grow their businesses. In addition, Bank A strived to improve cost to income ratio by improving its business processes. As a result, Bank A was awarded "Cheapest Business Bank Transaction Account" five years in a row (2010-2015) by Money magazine.

In terms of *organizational structures* and institutionalizing, Bank A's leaders used lower degrees of centralization in implementing IT-enabled innovation and some financial product innovation initiatives. Bank A adopted distinct organizational structures for different parts of its organization to respond to different environmental changes. For example, leaders provided flexibility for particular areas, such as the Cards team, by adopting a more decentralized structure to enable the team to respond to customers quickly:

> *Within the Cards team we have a team within the team that actually manages the Card system, so we have a lot of flexibility to be innovative with our pricing - more so than other product areas. So we can work within our team and make changes very quickly, within a couple of weeks, so we can be first to market because we've got that flexibility of the systems.* (Senior Product Manager-A)

This finding is in line with that of Johne and Harborne (1985) who found that more active product innovator banks were more likely to have lower degrees of centralization for implementing product innovation. Decentralization complemented with high levels of formalization is often preferred to implement innovation and realize opportunities because it allows managers at lower levels of hierarchical structures to make relevant decisions to respond to environmental changes in a timely manner (Foss, Lyngsie, & Zahra, 2015). In this sense, project control (some levels of formalization) is still required in agile projects to guide the project execution although the control process, or standardization needs to be simple to provide flexibility enabling the organization to react quickly to changing business requirements (Conforto & Amaral, 2010).

In the institutionalizing phase of 4I organizational learning, Bank A's leaders also strived to build an *organizational culture* or climate that supported the dissemination of institutionalized knowledge. For example, as previously mentioned, Bank A's values of openness and respect among the bank members supported the sharing of knowledge required in the institutionalizing process. The activity-based working environment also has enhanced interactions and a knowledge sharing culture among organizational members at Bank A, as implied in the following comment:

> *They're happier to come in to work... there's much more social things coming here because everyone's in the same building, so there are a lot of meetings with everyone involved.* (Associate IT Specialist)

This activity-based working environment also supported the institutionalization of agile methods by facilitating co-location and communication among agile team members at Bank A. Vermeulen (2004) argues that most project-based work at banks suffers from low communication among team members and is not conducive to innovation. By combining agile methods and the activity-based working environment, Bank A strived to improve communication among agile team members in delivering IT-enabled innovation projects. In addition, to fully institutionalize the agile methods in the organization, Bank A has tried to nurture a "can do" innovative culture. This is in line with the idea of Iivari and Iivari (2011) that leaders need to drive an organizational culture that values equity, empowerment, commitment, participation, learning and continuous improvement, respect, trust, openness, and communication.

In terms of *organizational resources* and institutionalizing, Bank A's leaders sometimes faced conflicts between agile projects and resource allocation. Wei et al. (2014) found that high resource flexibility enables organizations to use existing internal resources more easily for new purposes which then reduces the need for totally new resources to pursue exploration. In other words, an organization can share resources for exploring new initiatives since the resource portfolios are not bound to specified projects to deliver existing products or processes. In the case of Bank A, leaders strived to solve the conflicts between agile projects and resource allocation by enabling resource sharing within a domain level:

> *From a resource availability perspective, we'd expect any of that conflict be resolved at a domain level. We've got a finite amount of resources and a finite budget that you'd spend within a year. But you don't know how the year's actually going to play out, so you may be in one particular domain and you say "Actually to complete this piece of work, I need a certain type of resource to help. I've got fifty percent of what I need, I need another fifty percent over here. So you've actually got somebody available, so can we borrow those people to actually resolve this here and get that delivered?" So a bit of horse-trading.* (Senior Manager of Architecture)

However, as previously mentioned in the interpreting section, Bank A also had to relax the scope of the agile project since they had finite budgets. In addition, Wei et al. (2014) also found that coordination flexibility is required to efficiently integrate and recombine internal and external resources for pursuing exploration. At Bank A, with relatively increased communication and high collaborative behaviors among the agile team members, the coordination had been leveraged although it still needed to be improved.

While the bank has realized the benefits of agile methods (see Section 4.3), in some instances the technology development team's limited experience in new product or process development using agile methods may affect their ability to identify potential risks during the development process. This then influenced their attitudes towards the risks of the agile methods and the institutionalization of the agile methods. This is implied in the comment below:

> *Whilst it's good because it's flexible, I guess because things happen so quickly, sometimes not everything is considered, which can expose the risk.* (Senior Product Manager-A)

Conboy et al. (2011) argue that leaders should implement relevant skills development programs and specific recruitment policies to ensure that specific skills are available to undertake agile development approaches. At Bank A, to minimize the staff's apprehension towards agile methods and to promote further institutionalization of the methods, Bank A introduced a series of agile training courses to promote agile practices as part of the organizational culture. This would also improve the resource and coordination flexibility at Bank A which in turn would promote more explorations. However, it appears that Bank A needed to provide even more agile training courses and adopt recruitment policies for supporting the adoption of agile development approaches.

In general, leaders at Bank A assigned staff, created structures, or formed a project team to institutionalize changes or innovation at Bank A. Leaders used the strategic vision of being customer-focused to integrate different views and achieve a shared understanding for coherent and collective actions in the institutionalizing phase. The strategic priorities to achieve higher efficiencies through IT-enabled innovation in a resource-constrained environment assisted staff to frame their ideas related to the implementation of the institutionalized strategy. However, the bank also differentiated its financial products to cater to niche markets although the bank emphasized more on increased efficiency. To provide the flexibility required to pursue both cost-leadership and differentiation strategies simultaneously, leaders of Bank A used different organizational structures in different areas within the organization. For example, Bank A adopted a decentralized structure for the "Card" team to provide more flexibility for the team in terms of pricing to enable them to respond to the changing business environment in a timely manner. In addition, leaders of Bank A fostered a "can do" innovative culture to promote

communication and knowledge sharing among staff to enhance the institutionalization of new learning. For instance, Bank A used both activity-based working environment and agile methods to improve communication among agile team members to deliver IT-enabled innovation. Moreover, leaders of Bank A strived to improve resource and coordination flexibility to enable the bank to reconfigure its capability to deliver new IT-enabled innovation. For example, the bank provided agile training to enhance institutionalization of agile practices across the whole organization in order to strengthen the delivery of agile projects. The bank also improved collaboration and coordination among staff to enable resource sharing in undertaking IT-enabled innovation projects. The resource and coordination flexibility could allow resource sharing and effective collaboration between different individuals or across different project teams and functional areas in institutionalizing new learning. This is very critical in the face of a resource-constrained environment as the organizations need to be more efficient.

4.4 Chapter summary

Bank A had relatively high rate of innovation but characterized by mostly process innovations to increase efficiency. This could be associated with exploitation. Nevertheless, some process improvements involved significant business process changes that could be linked to exploration. For example, Bank A changed its call center to a national virtual contact center to increase efficiency and improve customer service. In the face of challenging business environments in the Australian financial industry, characterized by slower market growth, increased competition in a lower interest rate environment, and regulatory changes, Bank A had to operate very efficiently. However, Bank A found it difficult to compete merely based on lower cost since larger banks could gain benefits of economies of scale in terms of infrastructure and cost funding. As such, Bank A had to differentiate its services by introducing new niche financial products that could be linked to exploration. The challenging business environment required Bank A to adopt new technology in innovative ways to meet customer demand while still complying with regulations. In this way, Bank A had to adopt both technological-based innovation and administrative innovation to achieve competitive advantage.

In investigating Bank A's approaches to organizational learning ambidexterity, Bank A tended to focus more on a cost-leadership strategy and increased efficiency rather than on a differentiation strategy when it faced the resource-constrained environment. This confirms Cao et al.'s (2009) findings that resource-constrained organizations need to manage a trade-off between exploration and exploitation. Overall, Bank A's approach to organizational learning ambidexterity was characterized by higher exploitative learning coupled with lower exploratory learning.

Turner et al. (2013) state that organizations can also adopt the other three broad approaches to pursue organizational ambidexterity, i.e. temporal, structural, and contextual ambidexterity. Bank A achieved organizational ambidexterity sequentially through a temporal approach by pursuing exploration in the first inception of cloud computing and agile methodology followed by pursuing exploitation in the refinement of its use into all its operations. In addition, Bank A tried to pursue exploitation and exploration simultaneously through both structural and contextual approaches. The bank used a structural approach where a separate organizational unit was explicitly set up to be responsible for exploration. For instance, it has a dedicated unit (the Segment Business Development team) to pursue exploration in learning customer needs in various market segments. Bank A also adopted contextual ambidexterity where an ambidextrous culture (consisting of organizational task-related diversity and shared vision) was created to enable the organization to simultaneously pursue exploration and exploitation. Leaders of Bank A encouraged diversified knowledge or ideas in the initiation phases of innovation, particularly in the intuiting and interpreting phases of organizational learning, by allocating time and providing mechanisms like "Innovation Days" for lower management levels to put ideas forward. Conversely, these leaders promoted the integration of different views using the vision and strategy in the innovation implementation stage, particularly in the integrating and institutionalizing phases of organizational learning.

Berson et al. (2006) suggest that the process of intuiting and interpreting could be associated with exploration of new knowledge and the institutionalizing phase could be linked to exploitation of existing knowledge. Leaders of Bank A promoted varieties of ideas during the intuiting and interpreting phases through various mechanisms, such as "Innovation Days". The organization's "can do" innovative culture ensured all staff were customer-focused by integrating different views and encouraging collaborative behavior among organizational members. Leaders also communicated new changes and provided relevant training to facilitate institutionalization. The process of organizational learning in Bank A could be summarized in Table 4.2.

	How leaders adjusted the internal context (based on the phases of 4I Organizational Learning)		Type of Innovation pursued and approaches to ambidexterity used

• **Competition**
  o Intensified competition due to the slow economic growth and regulatory change (Basel III)
 	
• **Customers' demands**
  o Increased use of mobile banking
  o Increased demands for niche products
 	
• **Development of technology**
  o Internet and mobile banking
 	
• **Strategic partners**
  o Assistance in delivering technological-based innovation (e.g. online credit card verification) and administrative innovation (e.g. Heroes program)
 	
• **Government or regulations**
  o Standards and compliances were mostly perceived as inhibitors
  o However, new regulations and standards for increased accountability also promoted process improvements
	Intuiting	• Leaders stimulated individual organizational members' creativity by developing their competences and motivating them to innovate through the creation of conducive working environment:
		  o Strategy: setting strategic priorities in customer relationships, productivity, people and culture, and sustainable growth
		  o Structure: creating a dedicated function to explore opportunities in various market segment; decentralization of IT function
		  o Culture: creating a "can do" innovative culture (e.g. thinking outside the box, recognition, allocated time for innovation)
		  o Resources: using IT that supported agile development and promoting the pursuit of innovation aimed at increasing efficiency due to limited organizational resources; external innovation partners (such as external consultants) were often invited to provide inputs for changes (e.g. the development of an employee incentive program).
			• **Innovation**
			• Mostly process innovations linked to efficiency (exploitation) i.e. incremental business process improvements; however, few radical technological-based innovation (e.g. national virtual contact center) can be associated with significant process improvements (exploration)
			• The introduction of some new financial products catered for niche markets linked to differentiation (exploration)

	Interpreting	• Leaders provided a shared interpretation for guiding innovation activities and facilitated constructive dialogues to allow the acceptance of new ideas and insights:
		  o Strategy: communicating an overarching vision and strategy which emphasized productivity and innovation
		  o Structure: changing personnel to bring in new interpretations (e.g. related to the Agile methodology); introducing new programs to infuse new interpretations related to the need for innovation
		  o Culture: facilitating collective interpreting by enabling interaction and knowledge exchange among staff through various mechanisms, such as activity-based working and Yammer
		  o Resources: sharing common interpretations related to resources i.e. understanding the resource constraints (e.g. finance and legacy systems) that could limit the pursuit of innovation
			• **Approaches**
			
			o Overall: focusing on a cost-leadership strategy and efficiency rather than on a differentiation strategy
			
			and also
			
			o Temporal: the first inception of cloud computing and agile methodology followed by the refinement of its use in all its operations
			
			o Structural: a dedicated unit for exploring new market segment i.e. the Segment Business Development team
			
			o Contextual: the encouragement of diversified knowledge and ideas in the intuiting and interpreting phases through e.g. Innovation Days and integration of views in the integrating and institutionalizing phases through the use of a "can do" innovative culture which ensured all employees were customer-focused

	Integrating	• Leaders guided the integration of new and existing knowledge by facilitating a shared understanding at both the group and organizational level to allow for coherent collective actions:
		  o Strategy: focusing on efficiency through IT-enabled innovation and striving to differentiate more of its financial products
		  o Structure: using formal regular leadership team meetings at the executive levels; cross-functional teams (e.g. business and IT function) at lower levels of management
		  o Culture: communicating a "can do" innovative culture and sharing a common vision of "customer-focused" to achieve integration of views
		  o Resources: focusing on efficiencies and compliance with government standards and regulations (e.g. Basel III)	

	How leaders adjusted the internal context (based on the phases of 4I Organizational Learning)	Type of Innovation pursued and approaches to ambidexterity used
	Institutionalizing • Leaders facilitated the organization-wide implementation and adoption of innovation as well as institutionalized new knowledge in such a way that enabled simultaneous pursuit of exploration and exploitation: o Strategy: monitoring strategies to implement changes by creating necessary structures (e.g. the pursuit of IT-enabled innovation to improve efficiency and the pursuit of new financial product innovation to achieve a competitive advantage) o Structure: using different structures for different parts of its organization (e.g. a more decentralized structure of "Card" teams) o Culture: fostering a "can do" innovative culture which involved th e combination of an activity-based working environment and agile methodology to improve communication and coordination among staff o Resources: developing resource and coordination flexibility (e.g. providing more agile training courses and adopt recruitment policies to support the institutionalization of agile methods; needing to relax its agile project scope due to fixed budgeting)	

Table 4.2: The process of 4I Organizational Learning (OL) at Bank A

Chapter 5: University A - Case analysis

5.1 Introduction

In this chapter the researcher presents and analyzes data from the mini case of University A, which is an Australian public university with large multi-campuses serving communities in State A and internationally. The origins of this University can be traced to the establishment of a teacher training college in 1902. Over the period of 1955 - 1972, five other teacher training colleges were formed. All these teacher training colleges were amalgamated in 1982 and became University A in 1991. According to its 2014 annual report, the University had 1,772 staff. In 2014, the University had 22,984 student enrolments at undergraduate and postgraduate levels, including 3,323 international students. University A was chosen in this study because as of 2014 it had achieved a 5 star rating for teaching quality, generic skills, and overall graduate satisfaction for six consecutive years, as published in the Good Universities Guide. It was also stated in the 2012 audit report of TEQSA (Tertiary Education Quality and Standards Agency) that this University demonstrated a commitment to improvements and quality assurance in all its operations through the implementation of several plans and projects. It was further reported that the University achieved significant changes in three related areas: "a renewed attention to engaging with the community, a major curriculum reform project, and a consistent approach to internationalization". In addition, University A has grown significantly since it was granted university status in 1991.

The data in this study were gathered from the corporate website, brochures, press releases, annual reports and twelve face-to-face interviews with staff members from the different functions within University A from April 2014 to July 2014. The interviewees included senior executives from Corporate services, Academic operations, Marketing and Communication services, Human Resources, the Office of Research and Innovation, senior managers from the Graduate Research and Learning and Development centers, Resource Planning and Operations and the Information Technology department; and senior researchers and an academic. Table 5.1 provides a list of participants who were interviewed.

No	Participant's position
SE1	Senior Executive (Corporate Services)
SE2	Senior Executive (Academic Operations)
SE3	Senior Executive, Marketing & Communication Services
SE4	Senior Executive, Human Resource
SE5	Senior Executive, Office of Research & Innovation
SM1	Senior Manager, Information Technology Department
SM2	Senior Manager, Graduate Research Center
SM3	Senior Manager (Learning and Development Center)

No	Participant's position
SM4	Senior Manager, Resource Planning & Operations
SR1	Senior Researcher
SR2	Senior Researcher
AC1	Senior Academic (Teaching/Research)

Table 5.1: Participants' details

In this chapter, the researcher first examines the external context faced by the university. The researcher then analyses how the external context has influenced the way senior leaders adjusted University A's internal context and facilitated the underlying organizational learning strategies that were or are being employed in the pursuit of innovation using the 4I framework (Crossan, et al., 1999) of intuiting, interpreting, integrating, and institutionalizing learning processes. Senior leaders play an important role in managing both exploratory and exploitative innovation (Benner & Tushman, 2015; O'Reilly III & Tushman, 2013). As with the case of Bank A in the previous chapter, the researcher analyzes the data collected in University A by adopting Berson et al.'s (2006) notion that the 4I learning processes of intuition and interpretation are associated with exploration and idea generation. The institutionalization processes of the 4I framework are associated with embedding new learning into routines, structures, and practices of the organization, while integration processes are those where exploration of new knowledge and exploiting existing knowledge is integrated (Berson, et al., 2006). It is where collective action is taken to decide to move ahead (or not) with certain innovations. Finally, the researcher concludes this chapter by identifying the approaches to organizational learning ambidexterity that the university has pursued in response to its external challenges.

5.2 External context

Applying the conceptual framework of the study which was derived from the literature review in Chapter 2, University A's external context will be examined in terms of competition, customers' demands, technology development, strategic partners, and regulatory environments. These constructs were identified as having an influence on how leaders adjusted the University's internal context and facilitated the underlying organizational learning for innovation.

The higher education sector generated $12.9 billion or 68.6 per cent of total on-shore earning from Australia's educational services. This means that the sector has driven education services to international students to become the third largest export earner in the country in 2015 (Department of Education and Training, 2016). However, Australian public universities have been operating in a resource-constrained environment due to increased competition and the tendency of the Australian government to reduce funding to them. As a result, leaders of University A had to develop a range of innovation strategies with a focus on increasing efficiency to respond to anticipated reduced revenues. Most innovations in University A were

process innovations linked to efficiency (exploitation) i.e. incremental business improvements. However, some of these improvements involved significant changes and leaders of University A considered these radical process improvements as exploration (e.g. the move of its entire datacenter to cloud computing). The University also adopted administrative innovation (e.g. centralization of "non-academic" units to improve coordination and efficiency). As such, exploration activities at University A do not only relate to new products or a differentiation strategy but also to radical process improvements aimed at increasing efficiency. Since the university found it difficult to compete merely based on efficiency, it also differentiated its services through the introduction of some new courses (e.g. Master of Professional Communication).

In the following sections, the external factors that drove the pursuit of innovation in University A will be examined in detail, beginning with competition.

5.2.1   Competition

5.2.1.1   *Competition for students*

Desmet and Parente (2010) argue that increased competition often requires firms to innovate to improve efficiency. University A faced competition in regional, national, and global markets. The global competition to Australian universities was not only coming from Western countries, such as the United Kingdom, the United States, Canada, and New Zealand, but also from Asian countries, such as China and Singapore (Doorbar, 2012). This was acknowledged by one of the senior managers in University A:

> *Other countries have now become more competitive in terms of attracting international students, and in 2012 the US senate conducted an investigation into higher education and they found that the private higher education providers in the US spend on average 22.7 per cent of their income on marketing. Our university spends about 4 per cent of its income on marketing, which is typical of Australian universities. So my hypothesis is that we're being out-competed by universities in America, in Canada and Europe and the UK, and also in the home countries who are growing more university capability to attract their own students, so the global competition for international students has significantly increased.* (SE1)

In 2013, University A's international students were around 15.6 percent of the total students. The international students consisted of Asian students (69.5 %), African students (15 %), European students (6.3 %), Middle Eastern students (5.9 %), students from Americas (2.8 %), and students from other countries (< 1 %). However, the number of on-shore international students has decreased considerably (approximately 15 percent) over the last few years from 2,732 students in 2010 to 2,307 students in 2013 (13 percent of total student load). The reasons for this reduction were increased competition from their international counterparts, the strong Australian dollar, and policy changes for student visas.

In State A, University A is presently competing with four other universities, one of them being a private university. In 2015, all State A universities faced a significant reduction in local undergraduate student enrolments known as the 'half cohort' because the number of local year 12 students (the final year of secondary education) in 2014 was half what was normal (a result of the change of starting school age imposed in 2001) (Long, 2014). The number of applications from school leavers in State A fell by about one-third (Wearne, 2015) and an official from University A confirmed that the scale of impact of the half cohort was as expected.

As a result of increasing competition for both domestic and international students, most universities in Sate A have become more aggressive in their marketing activities:

> *The competition is very fierce. All of the universities, apart from [an Australian private university in State A] for example, do television advertising now. They do much more advertising than they've ever done before. There's much more competition for international students across universities. It's very aggressive.* (SE3)

Nationwide, University A competes with 39 other Australian universities to attract both domestic and international students. In addition, some TAFE (Technical and Further Education) colleges have been accredited to offer a limited number of undergraduate degrees (Craig & Dow, 2010). In 2012, the Federal Government introduced a new student-demand-driven system that allowed public universities to respond to the domestic student demand for Commonwealth supported places. The Government's review of this system in 2013 found that it had encouraged universities to pursue innovation by being more responsive to student needs and improving the quality of student education (Department of Education, 2014). However, based on University A's 2013 annual report, the demand-driven policy had little impact on the growth of domestic students in Western Australia. The reason for this, according to one of the interview respondents, is as follows:

> *In [State A], the population is significantly underrepresented in higher education participation, so a lot fewer people in [State A] have university degrees or are undertaking university degrees relative to the Australian average.* (SE1)

The Federal Coalition Government came into power in 2013 and subsequently announced its intention to undertake reviews of higher education funding, participation targets, quality assurance, and regulatory burden. Political pressure to return the Commonwealth budget to surplus, in an environment of falling tax revenues, had led to a reduction of higher education funding in the final term of the previous Gillard/Rudd Labor Government. The 2014-15 Commonwealth Budget handed down in May 2014, proposed significant structural and funding changes to higher education including: an average 20 per cent reduction in funding for Commonwealth-supported places; fee deregulation to allow providers to set their own student fees for domestic students; extending the provisions of the demand driven system of uncapped places to non-university providers and to sub-Bachelor level qualifications, including the

provision of government funding; and the introduction of student fees for research higher degrees. These changes were expected to have an impact on the competitive landscape of the domestic student market in a way that was not previously faced by any Australian universities, which according to Abbot and Doucouliagos (2009) have hitherto faced lower competition in this market sector.

The changes mentioned above would imply that University A would need to reduce costs without sacrificing the levels of differentiation of its courses in terms of teaching quality, generic skills, and overall graduate satisfaction acknowledged by the Good Universities Guide. It could mean that University A would have to be ambidextrous by pursuing both cost-leadership and differentiation strategies simultaneously to achieve higher efficiency and deliver a broader product offering that better suits its customers as suggested by Santos-Vijande et al. (2012). During the interviews conducted at University A in mid-2014, several respondents were of the view that the proposed educational policy changes would affect competition and induce University A's members to innovate:

> *I think this year we're going to see substantial industry change in relation to the ability of universities to use price as part of its product mix, which we don't have at the moment, and competition from non-traditional areas within the higher education sector. There will have to be different ways, different business models, to achieve ongoing sustainability. I think that we need to be quite aggressive in terms of how we keep ahead of that.* (SE1)

> *The fees deregulation is something that will require innovation by all higher education institutions because it brings into the mix some external private institutions that are eligible for similar funding as universities but actually don't have the same regulations that universities have.* (SM1)

Universities have responsibility to undertake dual missions of teaching and research, but other higher education institutions (such as TAFE and private colleges) only focus on teaching. The proposed policy changes would offer new opportunities for non-university higher education providers to compete more intensely with universities in attracting Commonwealth-sponsored undergraduate students. Because the subsidies would be distributed more widely, the funding rate for universities would decrease. The Federal Senate rejected the proposed changes in December 2014 (Borello & Gul, 2014) but the Federal Government continues to push for reform in the higher education sector.

5.2.1.2 *Competition for research funding*

University A competes not only in recruiting new students but also in obtaining research grants. The previous Federal Government's cuts to university research funding have resulted in increased competition for research grants. The current Federal Government is expected to

reduce funding further (Knott, 2014). This has implications for a university's need to be innovative in order to attract such grants and top level researchers:

> *The competition in research is over limited funding availability, limited research grants, but also for research staff. So, there's competition between the universities to attract and retain good research-productive staff. I think a potential employee would be attracted to go to an innovative organization rather than an organization they see as standing still.* (SM4)

Faced with multiple threats of radical higher education policy changes and the half cohort that could produce constraints on financial resources, University A has also been striving to achieve higher internal efficiency:

> *The main area is around efficiency and cost effectiveness and not wasting money, because what's happening is that our costs are going up every year but the income that we get is not meeting the cost increases. And so we need to make sure that whatever we do internally is as efficient as possible.* (SE2)

To sum up this section, competition on a number of fronts brought on by the higher education deregulation and the half cohort issue has encouraged University A to examine innovation opportunities in both student recruitment and research funding.

5.2.2   Customer demand

Customer demand can also stimulate innovation (Godin & Lane, 2013). Future demand for higher education in Australia is projected to grow by approximately 344,000 students in 2020 and 563,000 students in 2030 (Go8, 2014). In 2013, 95,729 international students commenced their studies in Australian higher education, which was an increase of 8.1 percent from the previous year (Australian Education International, 2013b). Seven point two percent of these students were studying in State A (Australian Education International, 2013a). University A had 17,680 students at undergraduate and postgraduate levels in 2013, including both domestic and international students.

In 2010, University A had anticipated the effects of the introduction of a student-demand-driven system by the Federal Government and the half cohort (Section 5.2.1) on its demand. The student-demand-driven system would remove the "cap" on over-enrolments and the "safety net" guaranteeing funding for under-enrolments. This would create opportunities for University A to take more students. The student-demand-driven system was implemented in 2012. However, one of the senior leaders stated that University A had not developed appropriate capability models (as big universities had already done) to take advantage of these opportunities. University A experienced a relatively stable Commonwealth-supported student load in 2013 but this was mostly because of the historically lower levels of unmet demands for higher education in State A. In addition, University A would face the half cohort resulting in significant reduction

in student enrolments in 2015. This half cohort would be Commonwealth-supported students and in 2013 this category accounted for approximately 73 percent of the full-year total student load of University A. The considerable reduction in the Commonwealth-supported students could influence the University's budget significantly.

The education reform proposed by the Federal Government in 2014 could potentially discourage domestic students from pursuing higher education due to the uncertainty it causes. The reform would enable Australian universities to set their own price for their major undergraduate courses (StudyAssist, 2014) and would affect the course fees at prestigious universities significantly (Lane, 2014). While the Federal Government's deregulations have been rejected for the second time in March 2015, the Government appears to insist on passing the proposed higher education reform (Lewis, 2015). Under the 2014 education budget, local students using HECS/HELP systems would be required to pay interest rates to reflect the government borrowing cost. HECS (Higher Education Contribution Scheme) or HELP (Higher Education Loan Program) is a Commonwealth Government loan scheme provided for students who are enrolled in Commonwealth supported places. This means they would pay an interest rate to a maximum of 6 percent per annum on their student loan (StudyAssist, 2014). Being asked about the proposed education reform in the mid of 2014, one of the respondents was of the view that such reform could impact on the domestic student demands and affect the University A's budget:

> *A new government has a radical education reform agenda… that would make education much more expensive and in those circumstances we would have to try to position ourselves in a market base, which might mean that we try to do more with less again.* (SR2)

The 2014 Federal Budget could also have affected domestic student demand for postgraduate studies by applying fees to postgraduate research courses for the first time. Although these proposals were not passed by the Parliament, they could be considered again in future budgets and be a source of threats to student demand for post graduate research courses. In addition, domestic students enrolled in the Doctor of Philosophy (PhD) courses have uncertain job prospects due to limited job opportunities for researchers (Metcalfe, 2013) and this can limit the number of domestic students enrolled in this program:

> *In this country fifty percent of [post]graduates across Australia will be academics. The other fifty percent – industry or not sure, so there's a change. That's an external factor which means that our universities in Australia are saturating and there isn't going to be the job market. We have to think about our courses and skilling our students not just for academia, not just to teach and research, but how can they offer services to business and industry.* (SM2)

With a relatively small growth of domestic PhD students, senior leaders at University A realized that they needed to pay more attention to the international PhD student market in the near future:

Domestic PhD students are very hard to attract, so the international market becomes much more attractive for us because there's a very big market, you know, not just Asia but also South America and even the United Kingdom, there's a big international market. So I think for us, looking at funding models, and in Australia I think PhD domestics have plateaued. (SM2)

In short, University A faces threats to domestic customer demand at both the undergraduate and postgraduate levels and in the areas of both coursework and research courses, which is forcing it to consider changes in existing operations.

5.2.3 Development of technology

Danneels and Sethi (2011) argue that technological change can promote innovation. Information technology (IT) in the form of Blackboard or WebCT, video-conferencing, and internet calling services has enabled online education delivery and complemented face-to-face meetings (Renes & Strange, 2011). The development of technology has provided opportunities for University A to enhance its education services both in its teaching and learning activities as well as in its administrative processes:

There are so many good things that are actually happening in the world of technology, and you would like to get and make use of it. You try to adjust and adapt to what the University can offer and how they [external provider] can offer it, and put that into the system. (SM3)

Well technology, obviously moving from a paper-based or a physical thing to online forms and online approvals and all those sorts of things, that speeds up things and makes things more efficient. (SM4)

One of the significant impacts of technology advancement in the higher education sector includes the provision of on-line learning:

I think that technology has enabled the higher education sector to become more of a global industry. So basically education will be delivered from anywhere to anywhere, provided the student has access to technology to consume the education that way. (SM1)

We at the University need to get a good balance between what can we offer students in the way they want it, online as well as what type of face-to-face. I think it's technology and competition as a combination that's actually driving us on that one [innovation] I think. (SM3)

In addition, because existing technology can place limitations on the range of innovation that can be adopted, the university has been striving to invest in technology that can provide flexibility to meet evolving technological requirements:

One of the things that we're doing is if somebody asked me what the one thing that we're looking at to do with our investment in technology and our technology services, is to become as flexible as we possibly can. By being flexible we can respond to different

changing needs, so I think our model of building in flexibility is going to be very important in the future. (SM1)

Weill et al. (2002) propose that organizations need to invest in IT infrastructure that can support their future strategic agility and need to determine the appropriate combination of IT service required to create that agility. The need for increased efficiency and IT flexibility has also encouraged the university to explore technological opportunities like cloud services in order to improve business processes in the university:

> *... we're looking at moving to cloud services, moving to network as a service, moving to desktop as a service and what that really is, is really linking your cost structures to your revenue. So it's saying that we can get more of that if we've got a higher student load, but if we have lower student load then we're not paying for it, whereas at the moment we have our own data center. We manage all of that ourselves, we own all of the equipment and there's no flexibility in that, whereas when we're buying it as a service from an external provider we just pay for the service that we're getting. And that's very much linked to our students.* (SM1)

The first-time adoption of new technologies like cloud services could be associated with exploration activities and the refinement of the use of these technologies could be linked to exploitation. This is one example of the pursuit of temporal ambidexterity by university A in which exploration of new technologies was often followed by exploitation or refinement of these technologies.

To sum up, the development of IT (particularly online learning) has created an opportunity for University A to reach new students either previously disadvantaged by distance (e.g. from remote areas) or who require time flexibility (e.g. working students). In addition, technological advances can also enable the university to be innovative in the back office by reducing costs and improving processes in its operations.

In the next section, the researcher explores how strategic partners can affect innovation at University A.

5.2.4 Suppliers and strategic partners

Involvement with external innovation partners can help organizations explore new initiatives (Schamberger, Cleven, & Brettel, 2013). Volberda et al. (2013) propose that external consultants are often key agents in introducing management innovation that changes the organization's business processes significantly. For example, the university worked with a consulting company to look for opportunities to streamline its business processes and in turn provide better services for students:

> *I had a consulting company come and help us develop this and I said I don't want to look at universities and how they do it – I want to look at the best processes of all different types of industries and take the best and put them into a model that we can*

implement. And then we've got our people aspects, so we've got new staff, new roles, which bring new capabilities, new experience models. So that's an example of a disruptive innovation which we've already done. (SE1)

To overcome the challenge of working with external consultants to integrate the external knowledge base and the internal firm context-specific knowledge base as posited by Birkinshaw, Hamel and Mol (2008), in this partnership, University A took an active role in contextualizing new practices, processes or structures recommended by its external consultants. The university worked together with the external consultants to find business solutions that were workable for the university-specific context. Because the university understood the internal firm context-specific knowledge base, the university could advise the external consultants that some generic best-practice knowledge would not necessary work due to the specific conditions within the university.

In addition, despite increased competition for students between universities, University A also cooperated with other universities to negotiate with the government and to work collectively in research, as outlined by one of the senior executives:

> *I also go out of my way to make sure that we work collegially with the other universities such that we, all of us, put our best foot forward for the government. I recall when I first started here a little over two years ago, there was always this image that the universities were extremely competitive, and yes, we are all competitive for students. However, there are ways in which we can, I think, collaborate more closely and over these two years I have seen things become much better. We are extremely collegial, people in my role for example, we get together periodically; we also get together with the DVC Research at another meeting, we're really looking at ways that we can work together.* (SE5)

Increasing research and development (R&D) costs and growing technological complexity tended to encourage competitor collaboration or "coopetition" in exploring new initiatives among universities. For instance, an interview respondent stated that University A tried to collaborate with other universities in State A to bid for cancer research equipment grants provided by the Cancer Council of State A in collaboration with BHP Billiton. While there was increasing interest for doing inter-university collaboration, there were some challenges as well. One of them is interpersonal issues, such as differences in philosophical approaches, lack of common language and values, decision-making with lack of consultation, unresolved issues around power, and hidden or unresolved conflicts (Willcoxson, Kavanagh, & Cheung, 2011). This also may include different requirements for research publications in which certain universities may ask their members to publish in peer-reviewed journals listed in ERA (Excellence in Research for Australia) while other universities outside Australia may use different standards like being listed in "Scopus". Inability to resolve these issues could impede university members' engagement in collaborative works with other researchers from different institutions.

To sum up, strategic partners may help University A find innovative solutions by introducing best practices and new knowledge which are not readily available internally.

As a public university, University A is significantly influenced by the government and this could affect its innovation. In the next section the researcher looks at the government or regulatory environment faced by University A.

5.2.5 Government or regulatory environment

Regulation affects innovation because regulation can change organizations' contexts and in turn influence innovation choices within an industry (Firth & Mellor, 1999). Apart from governmental-related issues like funding mentioned in Section 5.2.1, other governmental regulations impact on universities' operations. For example, the Tertiary Education Quality and Standards Agency's (TEQSA) requirements may induce Australian higher education providers to improve their accountabilities and corporate governance processes, particularly for those universities that operate below the national standards. However, these requirements are not adequate for universities to achieve excellence because they are only minimum standards for quality assurance (Baird, 2013). University A has maintained a good relationship with TEQSA to ensure the quality and reputation of its programs via course accreditation. In addition, University A needs to maintain its compliance with government regulations for the higher education sector beyond academic programs:

> *The other driver for HR is legislation, so we are a very compliant kind of environment and we have health and safety that come under our responsibility as well. That's probably more external actually, but there's a lot of factors where there's legislation and legal requirements which force you to have to do some reporting or do some of this stuff.* (SE4)

In his study of Australian public universities, Christopher (2014) found that the Federal Government significantly influenced the universities' strategic, compliance, and reporting requirements through its regulatory and funding framework. He further suggested that these universities were also subject to the regulations imposed by the state and territory government. This was confirmed by one of the interview participants:

> *We have the state government, we have the federal government. The state government doesn't have any money so they're not providing us with a lot of money. Having said that, they unfortunately at this period in time are very fiscally constrained which means they can be very influential about what happens in the tertiary education sector within our state, therefore we maintain a very good relationship with them. Federal government – we've had some good wins there in terms of the federal government providing funding for research. With the recent federal budget there have been several significant implications to the university in terms of student fees.* (SE5)

Having approximately 73 percent Commonwealth-supported students of the full-year total student load in 2013 (Section 5.2.2), University A's strategic direction and governance framework were tightly linked to the Government's funding arrangements. To some extent, regulations can inhibit organizations from innovating. For example, increasing bureaucracy and unnecessary reporting requirements can discourage innovation at universities. Organizations often have to allocate a lot of organization resources to meet compliance and reporting requirements leaving reduced resources to be invested in innovation (Rothwell, 1980). For example, like other Australian universities, University A faced the increasing burden of reporting requirements imposed by TEQSA and the Department of Education, particularly in 2012.

Thus, new regulation or education reform could both encourage and discourage innovation at University A. The university's 2013 annual report states that in the past few years there has been a tendency for the Federal Government to reduce university funding due to political pressure to minimize the Federal Budget deficit. As a result, Australian public universities are pushed to adopt a corporate approach to improve their accountability and to increase value for money through a reduction of public expenditure (Christopher, 2014). Under uncertain political conditions, organizations need to be able to manage both markets and governments well in order to survive (Li, Peng, & Macaulay, 2013). Because University A faced the uncertainties of government policy, it strived to pursue both cost-leadership and differentiation strategies simultaneously to enable it to achieve flexibility in order to respond to dynamic external challenges.

5.3 Four I framework

In the following sections, using the 4I framework, the researcher explores how leaders of University A adjusted the internal context of the organization in response to its external context in shaping organizational learning for innovation. The internal context of the university has been examined using elements identified in the literature review i.e. strategy, structure, organizational culture, and organizational resources.

5.3.1 Intuiting

In the intuiting stage where new ideas are developed and shared, leadership had significant influence on University A's organizational learning processes and its innovation activities. This is evident from the response below:

> *The internal factors generally are the leaders, the heads. So, it depends on who's head of the section, who's got the vision, who's got the foresight.* (SM2)

Senior leaders were often credited as the originator of radical changes at University A:

Where your accountability lies, that's usually the person or people that, in my experience, is where the radical innovation changes. Where there's just more continuous improvement that's probably at the lower level. (SE4)

In a press release, the former Vice-Chancellor of University A who retired in 2014 was credited as the source of entrepreneurial intuition (new knowledge with future orientation) at the University. Under the former Vice-Chancellor's leadership, University A positioned itself as an engaged teaching and research institution. In response to the external context, particularly competition and customer demands, University A has differentiated its services by developing a reputation for its teaching quality and support for students. University A also wants to be recognized as a university that is able to meet the needs of the community. The university has developed more partnerships with industry to enable it to create new applied knowledge that is useful to inform teaching in order to improve its graduates' employability.

The Vice Chancellor shared responsibility for leadership with the other senior leaders in specifying the university's vision and strategic goals. The senior leadership team of University A together with the University council provided the university's strategic direction with a strong vision of community engagement. In the intuiting phase, the university's *strategic priorities* gave a sense of purpose to inspire organizational members to develop new ideas:

Well the ideas are usually generated as a result of looking at strategy. So we may have strategic objectives to do 'X' and they'll be asking for ideas to help us achieve 'X'. So the ideas are already aligned with strategy to start with. They don't come out from nowhere. (SE3)

University A has five strategic priorities to guide innovation activities, as follows:

1. To create positive outcomes in its communities through mutually beneficial engagement;
2. To deliver accessible world-class education and an enriching student experience;
3. To enhance the personal and professional outcomes of graduates;
4. To strengthen research capability, capacity, translation and impact;
5. To enhance organizational resilience, sustainability and reputation.

In addition, to enable University A to grow during the anticipated resource-constrained period of reduced government funding and intense competition in both domestic and international student markets, senior leaders at the university initiated the "Vision of Growth" which aimed at increasing efficiency and developing appropriate business capability models to generate more revenue.

During the intuiting stage of organizational learning, the senior leaders of University A used vision and strategy to drive or solicit ideas from all organizational members on how to achieve the organization's strategic goals. As such, these leaders tried to encourage organizational members to develop intuitive ideas in this phase.

In the intuiting stage, the source of innovation did not always come from top management but also could come from lower levels of the organizational hierarchy:

> *I think to quite an extent innovation in [University A] is a lot at the level where the work actually takes place, and people come up with ideas and say 'let's do it like this,' and then they follow the steps of getting approval for an idea, and once they've got approval, then they start working with that.* (SM3)

New intuitive ideas related to technological-based innovation often came from frontline employees. Bottom-up knowledge inflow enabled leaders to better understand the daily operational problems and what the customers really needed. As such, leaders of University A strived to gather information about resource needs for technological-based innovation from organizational members at operational levels:

> *In our governance process, for example, that's driven sort of from the schools, faculties, the research people, all of the people who are closer to the student in delivering services to the students, rather than having a top-down approach. We very much have that bottom-up approach. So they feed through their ideas and their ideas sort of come through because obviously funding has to be available to make the changes.* (SM1)

University A leaders also tried to capture these intuitive ideas from lower levels of management through the formal hierarchy or *organizational structures*. For example, the university set up the Strategic Business Development Unit to enhance its capability to identify opportunities, assess potential return on investment and lead the implementation of plans to achieve the "Vision of Growth". This included the implementation of a new business development through the Marketing and Communication Services Centre to deliver growth in domestic and international student enrollments. The new Strategic Business Development Unit supported exploration in student recruitment activities by providing a mechanism for the capture of new ideas from staff and a guideline for the implementation based on iterative process of funding and development:

> *We also have a strategic business development unit. Part of their role is to take ideas generated from people across the university, particularly in the academic side mainly, or from within marketing, that will help us improve our revenue growth or student enrolments, and their role is to move that through a pipeline so it has different stages. Stage one is the initial proposal where you look at what the idea is and then if it gets past stage one then you go into more detail until it gets implemented.* (SE3)

In addition, as with other universities, University A has dual missions of teaching and research. Both LDC (Learning and Development Center) and ORI (Office of Research and Innovation) have been established to support exploration activities in teaching and research respectively. LDC assists the university to enhance the teaching and learning activities using current and emerging technologies. LDC had the online courses project that would offer new courses online.

ORI seeks to develop new mutually beneficial partnerships with other universities, industries, and the government to improve the university's research performance. The above dedicated units were established for exploration in particular areas determined by the organizational strategy and these "exploratory" units can be associated with the adoption of structural ambidexterity in which the structural separation provides space and resources for new initiatives in these areas to get started.

At University A, schools or "academic units" were decentralized to enable them to gather bottom-up initiatives as evidenced in the development of new courses. The new course offerings proposed by the schools were highly influenced by customer demands and internal organizational resources. According to Foss et al. (2015), in the intuiting phase, decentralized structures characterized by a high degree of autonomy could promote the generation of ideas by encouraging the participation of employees in problem solving and allowing organization members to seek innovative and new solutions. In University A, through their interactions with students, academic staff at schools identified potential student demands and future opportunities of developing new courses using a course viability model for the development of new courses to attract new students. The business case would need to demonstrate the need for and the benefits of the initiative, the identification of any significant challenges to implementation and the infrastructure requirements.

University A also formed cross-functional teams or parallel structures to encourage innovation. For instance, in response to increasing demands for online learning, staff from schools and LDC could work collaboratively in introducing new online courses. Staff could move back and forth between their daily activities in the units and their temporary projects of developing new online courses. University A also had a "secondment" program that provided opportunities for academics to experience the different environment at LDC. Being temporarily in a different environment outside their functional environment may enable organizational members to have broader perspectives than their functional perspectives which may stimulate them to generate new innovative ideas. This enabled individual staff to both explore and exploit knowledge and this can be considered a contextual approach.

To be effective, the organizational structures in universities need to be supported by a conducive organizational culture (Shattock, 2010). In the intuiting phase, leaders at University A strived to build an *organizational culture* or climate that promoted idea generation. Leaders at University A tried to create a working culture where organizational members were encouraged to take risks to pursue innovation by allowing them to take new approaches and tolerating some degrees of failure:

> *Innovation is about taking calculated risks and to make sure that what you're doing has been thought out, it's likely to succeed, or it's got a good chance of succeeding. If it*

*succeeds, great, learn from it and implement it and improve it. If it doesn't succeed,
then learn why it didn't succeed and don't do it again. So for me it's about just having
an open environment where people are willing to take risks and try things out, and I like
to support that type of activity where it's reasonable.* (SE2)

In addition, openness to new ideas and insights could stimulate organizational members to be
creative as Flores et al. (2012) argue that openness can facilitate a divergence of ideas
encouraging organizational members to think in new directions:

*I think there's a real drive and willingness to do new things. That openness or freedom
almost is there. I had an idea at one stage and I went to a very senior person in the
organization and said "I think we should do this – would you support this?" And the
guy, lady, whatever, said "Yes, by all means. Go and do me a business case and then
I'll take it from there". So yeah, good support.* (SM3)

Leaders of University A also created a culture of recognition to facilitate intuition among
organizational members. For instance, various programs related to recognition and rewards were
established to motivate organizational members to pursue innovation:

*We have various structures like the Vice Chancellor's Staff Awards which are either
self- nomination or nomination by peers of teams and individuals to recognize
performance and to recognize various ones, a number of which are focused on
innovation and improving the operations and financial performance of the university.
Individual service centers and faculties and schools have various layers from my
understanding, of recognition structures within them that will look at rewarding
behaviors. So there's both formal and informal structures throughout the university that
achieves those outcomes.* (SE1)

*We also have within our centre what we call the Max Star of the Month Awards which
is awarded to a staff member who has either gone above and beyond their work, or has
developed a new idea that has really helped out, or saving money, or making something
easier, or they've assisted a colleague above normal, or they've achieved in some other
way.* (SE3)

However, the 2014 internal staff survey showed that only 56 percent of respondents agreed that
the rewards and recognition that they received from their jobs at University A were fair. In a
study of Australian universities, Shah and Nair (2014) also found that individual academics
commonly urge universities to provide better workload models and improved reward and
recognition. Based on the 2014 internal staff survey, only 52 percent of respondents at
University A agreed that they had sufficient time to work on high priority projects and activities.
Only forty five percent of academic respondents and 61 percent of professional staff
respondents felt that their workloads were reasonable. It was often hard to get people across
different parts of University A together to share knowledge and collaborate in innovation
projects due to relatively high workloads:

*Everybody feels "I've got enough to do" and even you will have that propensity of
putting a committee together and inviting your stakeholders to work with you on
something. They're so busy with so many other things that they don't get there. That's
probably the biggest discouragement. A lot of people pay lip service to collaboration*

and working together. What I mean by that is that we speak the same language, but when it comes to the delivery of it, we're not yet there. (SM3)

In a study of an Australian university, Gengatharen et al. (2009) propose that the bureaucracy and the reward structures favoring individuals over team have deterred the redistribution of knowledge. University A also appeared to have a similar problem and it could be symptomatic of a constraint on resources. Therefore, leaders at University A need to develop better workload models and an appropriate reward system to foster knowledge sharing behaviors and facilitate intuition among the university members.

Organizational resources also had significant influences on the process of intuiting at University A. Apart from the perceived need by staff for additional resources that could improve workloads, other resource constraints often had an adverse effect on innovation. For example, technology development could provide opportunities for technological-based innovation but most of these innovations required high costs and consequently financial resource constraints could impede the pursuit of technological-based innovation and this appears to be University A's experience, as illustrated below:

> *People get very discouraged if they constantly come up with ideas but there's no funding to do anything with them.* (SM1)

However, it was interesting to note that to some extent the pressures of having less financial resource stimulated university members to seek new and innovative solutions:

> *The expectation is to still keep delivering the same kind of services but you actually have got less budget, you've got less resources, so in that kind of constrained environment it really does pressure you a lot to be "Okay, how can I do this smarter or better?"* (SE4)

For example, the intuiting process for new ideas related to technological-based innovation was often driven by the need for increased efficiency due to lack of resources, as implied by one respondent:

> *I think there's obviously the economy, a big one, a driving one, and Lynda [an online software training platform] is a good example. We're trying to save money by doing it online and not having a face-to-face person all the time in there.* (SM3)

In other instances, university members often had to pursue innovation using available resources at hand because of limited financial resource, as shown in the following comment:

> *"Well, we can do with what we've got". In some of the innovation areas, for example, my colleague is very keen for it to be a virtual network, virtual innovation system, and he's worked with something like that, very similar to that, when he was in Scotland, around mental health. There was a large virtual network around mental health. So, he's looking at something similar here, because that doesn't require additional resourcing in terms of infrastructure, perhaps just some time from somebody that's already on board.* (SE5)

In addition to financial constraints, the pursuit of technological-based innovation was often impeded by the university's legacy systems:

> *There is a considerable investment legacy that is very complex, very expensive to maintain. It takes so much resources to maintain the complexity of what we have. That leaves very little resources left over to innovate and to make change.* (SM1)

As such, in the intuiting process, existing technology could limit the range of technological-based innovation that could be adopted.

University A also often did not have all the required skills and knowledge to pursue innovation and it needed to collaborate with suppliers and/or consultants. In the intuiting process, these external innovation partners could provide insights on best practices and cutting-edge technology. For instance, the university invited a consulting company to look for possibilities in improving its processes significantly to support teaching and research activities. This was based on best practices and processes across various industries and not just the university sector and University A leaders themselves considered this move to be an example of disruptive innovation (see Section 5.2.4). In addition, the university also worked with a digital services provider to look for possibilities to move its entire data center infrastructure to the cloud. According to its website, University A in 2015 became the first Australian university to move its entire data center infrastructure to the cloud under a new agreement with an international leader in digital services. This could be considered another radical exploratory move on the part of University A by using an external innovation partner.

Overall, the senior leadership team had a highly significant influence on the intuiting process by inspiring university members to develop innovative ideas through the provision of the university's strategic direction. These leaders also encouraged the pursuit of new intuitive ideas by establishing dedicated units for exploration (e.g. Strategic Business Development Unit) and providing autonomy for organizational members to pursue exploratory ideas in particular areas. These leaders also created an organizational culture that promoted intuitive idea generation e.g. tolerance to a certain degree of risk-taking behaviors by allowing organizational members to take new approaches. The pressures of reduced budgets stimulated the pursuit of innovation aimed to improve efficiency. In addition, part of the intuiting process in University A in terms of radical innovation was learning from (or adapting) ideas that were generated by external innovation partners.

In the following section, the researcher discusses the interpreting phase of 4I organizational learning at University A.

5.3.2 Interpreting

In the interpreting phase, the role of strategic leadership was very important in guiding the interpretation of the university's strategic direction. Senior leaders at University A recognized the need for anticipating significant falls in revenue due to the reduction in government funding, the half cohort, and increased competition in the higher education sector. In order to reduce costs without sacrificing the levels of differentiation of its courses in terms of teaching quality, generic skills, and overall graduate satisfaction acknowledged by the Good Universities Guide, University A's strategic direction was to pursue both cost-leadership and differentiation strategies simultaneously to facilitate its flexibility in responding to dynamic external changes as suggested by Santos-Vijande et al. (2012). Thus, University leaders used this strategic direction to set the context within which ideas and intuitive insights should be interpreted.

In addition, as previously mentioned in the intuiting phase, senior leaders of University A also introduced the "Vision of Growth" initiative which aimed at increasing efficiency and developing appropriate business capability models to generate more revenues. One of the senior leaders was appointed to carry out this program. This program was used to guide the interpretations of any ideas and intuitive insights towards achieving the university's *strategic* direction. According to Berson et al. (2006, p. 583), a "leader's vision may be a source for building a shared language or mental model ultimately making the individual idea a group process". This appears to be the case at University A and the "Vision of Growth" initiative was approved by the university council at its March 2014 meeting and was communicated to the university members at a staff briefing in early 2014.

The "Vision of Growth" extended the "One University – Student First" project that was initiated in 2010. The "One University – Student First" aimed at making the university's administrative processes more efficient to support the delivery of teaching and research activities:

> *"The basic aim of "One University - Students First" was to look for opportunities for us to remove duplication from the organization and to improve our processes and activities so that we could effectively save money in non-academic areas to divert back to teaching and research programs."* (SE2)

Using the "One University – Student First" philosophy, senior leaders provided a sense of direction in finding novel ways to improve efficiency and provide better services to the students. The university's staff and academics were encouraged to develop new interpretations about the need for increasing efficiency and improving services for students through the "One University – Student First" project.

This "One University" approach changed the university's *organizational structure* by launching centralization initiatives, with the creation of company-wide services, the consolidation of

smaller units into larger entities, and the reinforcement of corporate control. Using the "One University" philosophy, senior leaders fostered new interpretations of the need for improved efficiency through the centralization approach, as implied in the following comment:

> *That sort of idea [centralization] where we effectively have central resources doing the work is what we tried to do everywhere, and the aim is really to remove duplication and to have the right people doing the job.* (SE2)

In addition, the "One University" approach was supposed to encourage collaborative behaviors and reduce a silo view among the university members:

> *I also think one of the things that encourage innovation in the university is giving faculties and service centers their budget and letting them manage within their budget. But in some ways that also discourages collaboration because I've got the money so I'll do it and I won't consider anybody else in this process.* (SM1)

In this respect, the "One University" approach was aimed at realizing synergy and improving company-wide coordination. For example, University A has centralized its financial control, illustrated as follows:

> *If we looked at financial advice, for example, what we effectively did was we took away all finance roles, so schools and faculties don't have their own finance people anymore, and we have faculty finance teams which are centrally funded and placed in the faculties to manage and do all of the financial activities of the faculty, but also to provide business analysis and strategic advice to the Dean and to the Heads of School in that area.* (SE2)

In addition, University A amalgamated some schools at the Faculty of Business and Law in 2013 for increased efficiency and improved multi-disciplinary or cross-functional work. With the increasing pressure for higher efficiency and coordination, University A would like to introduce further centralization through the "One University" approach. This appears to support Hogan's study (2012) that the need of making universities more manageable from a corporate perspective has led to the trend towards a smaller number of schools or faculties.

Leaders of University A also fostered new interpretations related to the development of new business capability models to generate revenues through the establishment of the Strategic Business Development Unit. The unit was expected to enhance the university's capability to identify opportunities, assess potential return on investment, and lead the implementation of plans to achieve the "Vision of Growth". This included the implementation of a new business development capability through the Marketing and Communication Services Centre to deliver growth in domestic and international student enrollments. While this mechanism was intended to elicit ideas for growth initiatives from the staff on the ground across the whole university, it appears that the mechanism was mostly used by organizational members in particular areas only (like in the marketing areas where the "Vision of Growth" has been translated into student commencement targets and a sales growth plan). Therefore, the university needs to

communicate this mechanism more actively to the entire university to encourage more bottom-up knowledge inflows and for members of schools to work with the strategic business development unit to investigate and develop ideas around new course offerings and opportunities.

University A also has a dedicated risk management function that assists the university's senior leaders to understand how organizational members at lower management levels perceived the potential risks they face in their specific organizational units in achieving the university's strategic priorities. Risk management activities could stimulate innovation and enhance teaching and research activities at University A:

> *We do have a Risk Service Centre and they're extremely helpful when we need to do our risk assessments. In terms of innovation, it will be considering all of the possible risk factors associated with not improving or updating our systems. If we don't do it, what's going to happen? What's the risk around that? We do have a lot of processes in place around risk. I have to do a risk assessment every year for my whole team, my whole area. There are a lot of risk assessments going on.* (SE5)

The risk management informed all aspects of the university's operations from the strategic to the operational level including teaching, engagement and research activities and thus was another way in which the context for interpreting ideas or intuitive insights was set. The risk management process was an interactive process that had to ensure that all participants and stakeholders understood the activity they were involved in, the related risk profile, and were able to contribute in mitigating risk and taking advantage of an opportunity. In this respect, the integrated risk management framework at University A enables organization members to codify information about new opportunities (exploration) in a formal way that could be better understood by the senior management.

In the interpreting phase, leaders of University A also tried to facilitate collective interpreting through the creation of a knowledge-sharing *culture*. For example, leaders facilitated formal and informal meetings where organizational members could interact and converse to exchange knowledge. This is illustrated in the following comments:

> *We have a management meeting, myself and our managers in HR and finance, once a month where we all get together and we all talk about what each area's talking about and give an opportunity for marketing to suggest an idea or how they can collaborate with Corporate Events.* (SE3)

> *We bring people round for coffee, we have meetings, we try and work with other centers* (SM2)

In addition, University A leaders also facilitated communication and knowledge exchange among organizational members by encouraging the use of IT-enabled communication, such as internal corporate social networking to share knowledge virtually in the interpreting phase. This was also expected to minimize the negative impacts of having separate physical locations and

unavailability of common rooms for staff. Respondents mentioned that physical working environment could influence knowledge sharing at University A:

> *Typically I wouldn't see, whether it be IT or Student Services or Library people unless we bumped into each other in meetings. We're in different buildings and on different campuses so there are physical constraints.* (SM4)

> *I think one thing that probably does is not having a staffroom in the building…. People don't actually have the time to interact, at least if you had a staffroom people will be coming in to make a cup of coffee – that will give opportunities to interact. It sounds so basic, and yet it's a major thing.* (AC1)

However, while University A does have Yammer (internal corporate social networking), it does not appear to be widely used by staff for idea development and is mostly used in specific 'invitation only' projects or for interest groups (e.g. the Wellness at Work group). In investigating the motivation and barriers to participation in online knowledge-sharing communities of practice, Ardichvilli et al. (2003) found that knowledge-based trust in virtual communities can be more readily achieved if it is based on already existing face-to-face communities. Research has also shown that leaders need to encourage regular communication and provide various channels to facilitate virtual team communication (Hambley, O'Neill, & Kline, 2007). For example, leaders themselves need to give examples by being active in this virtual communication space or being actively encouraging its use in order for it to be an effective knowledge-sharing tool.

A knowledge sharing culture is also encouraged in a culture of respect that promotes knowledge exchange and collaborative behaviors among the university members, as confirmed in the comment below:

> *The values of the university I think very much support the respect value particularly, really encourages respect for other people's role in the organization, which in turn fosters interaction and collaboration.* (SM1)

Based on the 2014 University A internal staff survey, 89 percent of respondents agreed that they had been treated with respect by other employees at University A. Respect allowed organizational members to express novel ideas or different insights which in turn facilitated the interpreting process from multiple perspectives necessary for innovation. As such, respect also facilitated the creation of a culture that allowed individual organizational members to have different perspectives. As part of an ambidextrous organizational culture, task-related diversity in terms of perspectives, skills and knowledge is required to enable the organization to pursue organizational ambidexterity (C. L. Wang & Rafiq, 2014).

However, high levels of this task-related diversity have also in some cases resulted in a silo mentality which in turn impeded resource sharing and collaboration, as indicated by one of senior leaders:

I think going back to people having a very siloed view of the university, so their view is just where they are in the university rather than thinking more broadly. That's probably the main condition that discourages collaboration. (SE5)

The university members from different schools or centers often focused on their own activities and functional perspectives which created significant challenges to collective interpreting processes. The university members from different functional areas had distinct sub organizational cultures with different sets of values, norms, and practices and they tended to interpret new knowledge based on their functional perspectives, as illustrated in the following comment:

I think there's a lot of diversity in the organization and a lot of people don't always see the diversity. Maybe it has something to do with the different cultures in different schools. There's that "I would like to do it in this way" and if you really go down into what it is all about, it's not that anybody has anything against the idea, it's the way in which you're doing it. (SM3)

Differences between individual views also could not be avoided as their interpretations of the external environment varied due to different interest, personality, and experience. For example, some university members showed their resistance to the interpretations suggested by the senior leaders due to the conflict with their personal interests, as described in the following comment:

People do not like change and changing the culture to accept a new direction, a new thing, do things differently. You know, it may mean some people losing their jobs maybe. But why? Because we have to improve otherwise the whole university goes down. (SM2)

In a broader view of organizational cultures of universities, Christopher (2012) states that Australian public universities have both collegial and autonomous cultures and corporate cultures. The collegial and autonomous culture is attributed to the existence of professional autonomy among academics who share a common goal. Conversely, corporate culture is depicted as the conformance to accounting and accountability requirements. One of the respondents at University A alluded to the tension between these two types of cultures:

I think there are places in the organization that have a business-type culture and you might find that probably from [Administration]. And then you might find at School X that this is a true blue academic and what I call a lot of times the sandstone type academic culture. It's almost like there's the best freedom of speech, freedom of doing what I want to do and how I want to do it. I think that can create quite a lot of tension. (SM3)

At University A, administrators and academics often had conflicting interpretations about the need for increased efficiency and structural changes. From a 4I perspective, such diversity of interpretations in viewing the need for improved efficiency and structural changes posed a significant challenge to the next phase of the 4I process, i.e. integration. Thus in the interpreting stage, senior management at University A tried to communicate the reason for higher efficiency

during the resource-constrained period i.e. to set the context for the interpretation of ideas or for new learning.

The senior leadership team also believed in centralization and strong leadership to achieve shared interpretations, as implied by one of the senior leaders at University A:

> *It's a matter of maximizing performance of your own business unit, which sometimes is not in the interests of the university as a whole. So that is a consistent issue across every organization I've been involved in, so it just needs executive focus.* (SE1)

This finding is in line with Berson et al's (2006) proposition that leaders are required to drive the group process of interpretation in order to reduce equivocality of interpretations of ideas or insights that occur among different members during the intuition stage.

University A also changed its leadership team to adopt new interpretation of ideas and perspectives, for example, in the office of research and innovation, IT service center, and corporate services. Some of the new leaders who were appointed brought in new perspectives and management concepts from outside the university sector. This is confirmed by one of the executive leaders at University A:

> *We're a university obviously and we have a culture of being a university, but when you talk about the operational side of it we actually operate very much like a business. We have finance people from the business world, we have human resources operating in a way that's very efficient, so all of our operations are very businesslike in the way they operate.* (SE2)

Having new leaders with a business background helped University A adopt a more corporate culture to its operations in response to the government reforms for greater financial accountability and increased efficiency in Australian public universities that Christopher (2014) advocated.

In addition to the above organizational culture, *organizational resources* also influenced the way leaders of University A both interpreted opportunities and formulated innovation strategies themselves and fostered the context of interpretations of organizational members, as implied in the following comment:

> *"What's it going to cost us?" Money will always be the first thing. It's about saying "Well, does it need additional resourcing either through people, FTE [Full-Time Employees], or is there infrastructure which is required?"* (SE5)

Some initiatives may not be feasible to implement because these initiatives required very high costs, incompatible technological infrastructures, and/or unavailable skills. University members exchanged ideas and shared interpretations about realistic business solutions that could be implemented, particularly during the resource-constrained period.

Senior leaders also had fostered new interpretations, changing from being technology-driven to services-driven to promote further alignment of IT and business strategies. This was aimed at making a more effective and efficient technology investment by investing in IT infrastucture that could support the achievement of the organization's strategic priorities, as illustrated in the following comment:

> *I commenced a project called IT@[University A] for the future, which was really looking at taking our technology investment and turning it from being an investment in technology to investing in services, so delivering outcomes rather than inputs.* (SE1)

This also promoted the adoption of new technology that could offer increased efficiency and IT flexibility, such as cloud computing. According to Gonzales-Martinez et al. (2015), the use of cloud computing will enable education institutions to access various online applications to support teaching and learning activities with relatively lower costs. Thus, such a radical exploratory move in adopting cloud computing would allow University A to be more agile in adopting new technological-based innovation, particularly in a resource-constrained circumstance. This is a good example where in some instances intuiting and interpreting phases cannot be demarcated clearly in tracking the source of innovation because knowledge exchange among organization members can lead to the development of new innovative ideas, such as the adoption of cloud services.

In general, the senior leadership team consistently used its strategic direction to set interpretations of its organizational learning and this was communicated to the university's stakeholders. The interpreting phase at University A was a relatively top-down process in which university members were expected to change their interpretations to comply with edicts from the top management. The "One University – Student First" approach was supposed to promote united interpretations and the members' commitments to the university's strategic direction.

Next, the researcher explains the integrating phase of 4I organizational learning at University A.

5.3.3 Integrating

In the integrating phase, the role of leadership in an organization is critical in determining whether it would pursue exploratory or exploitative innovation. At University A, senior leaders were usually in control of approving the pursuit of exploratory innovation because this type of innovation could impact on the university significantly. Leaders are expected to be ambidextrous i.e. they have to be able to facilitate the pursuit of both exploratory and exploitative innovation. Otherwise, they could fail to recognize the potential of new opportunities related to exploratory activities. University leaders were well aware of the pivotal role played by leadershp in the pursuit of innovation:

But then if you have a poor leader in a section, whether it's a school, a research center or a faculty, and if that leader doesn't get it, is not driving innovation and change and keeping an eye on the ball, it goes down. Leadership is very, very important. (SM2)

In additition, leaders should be able to integrate different views among organizational members in the phase of integration. Leaders have to explain the rationale of the inevitable changes driven by the external environment to promote integration of differences in perspective. External forces, like regulations and best practices, played a role in helping University A achieve a shared understanding of the need for and urgency of changes:

One of the ways he [the leader of Graduate Research School] did it really well was to explain that this was not University A's policy, that other universities were also implementing these changes, so that the staff all understood that the changes were inevitable. They also had come from the government, implemented through the government, and that other universities were putting in very similar policies. I've just been to a supervision compliance course and it became clear to me that staff objected less to these new changes. They could see the value in them. (AC1)

Nevertheless, in other instances, a shared understanding often could not be achieved. The integration process of learning is supposed to be an open and participative process but University A's senior leadership team tended to manage the integration process tightly after obtaining approvals from the relevant committees. University A has a committe system and the committees provide a mechanism by which matters may be explored more fully than would be possible at the university council. New significant changes had to be consulted with the relevant committees. The committees facilitated the integration of different ideas and solutions by allowing organizational members to interact and converse about new proposed changes or innovation in particular areas:

There are a lot of committee structures. All the committees encourage interaction. (SM2)

For example, University A has the "Fees Allocation Committee" which provides recommendations to the council and the student guild based on the inputs from internal stakeholders, such as service providers and other groups that represent special student interests. As such, it was expected that the stakeholders could achieve a shared understanding and support the decisions related to the proposed changes or innovation. However, with radical changes, a shared understanding and collective actions often could not be achieved. While some 'nay-saying' among the university staff could not be avoided, the senior management team would not allow conflicts with some staff to affect management initiatives and decisions at University A:

At the end of the day if agreement can't be reached or what we're being told we don't believe is reasonable, then I'll make a decision or the senior management will make a decision and that will be it. But it's not without consultation; it's not without a process. So we try and resolve conflict through negotiation and discussion and adjusting things, but it doesn't always work out like that. (SE2)

In a resource-constrained environment, leaders cannot afford to accommodate a broad range of bottom-up initiatives and they have to prioritize these initiatives due to the limitation of resources. As a result, the change management processes at University A had been widely perceived as quite a top-down approach, with a lack of consultation:

> *I don't think staff have been considered or consulted with anything. It's definitely a top-down approach.* (SR1)

The 2014 internal staff survey revealed that only 51 per cent of respondents agreed that they had been informed of the reasons for significant changes. In addition, only 51 per cent of respondents were of the view that they had been consulted in the change processes and had an opportunity to provide feedback. In this way, the senior leadership team exercised centralization. Although this approach resulted in the integration of behaviors among the university members, it did not however necessarily change the members' thinking. Those members who did not believe in management initiatives tended to wait for the outcomes to prove the legitimacy of the change or left the university.

Like other Australian public universities, the integration process was a challenging issue at University A. To deal with the diversity of perspectives among the university members especially during the resource constrained period, leaders at University A ensured that new innovation initiatives were aligned with the university's *strategic* priorities, as illustrated in the following comment:

> *The university sets its strategic priorities, so at the moment we have five strategic priorities, and we measure different opportunities against strategic priorities. For example, in terms of the building program or campus development program, we developed a matrix which had strategic alignment and cost. What we then do is say "The easiest ones to do are the ones with very strong strategic alignment and don't cost very much." So that's something that we do now in a range of different areas to actually quantify where possible, strategic decisions, and that's just one example.* (SE1)

In addition, University A has implemented an integrated risk management framework that enabled it to manage the corporate risk as a portfolio rather than manage risks of each of the organizational units individually. This allowed the university to take a more holistic approach in developing risk mitigation strategies. For example, University A tried to carefully consider the risks of introducing online courses as it might threaten its existing on-campus courses. Being aware of the risks involved, senior leaders at the university would be able to make an appropriate decision in the pursuit of both the exploration of new online courses and the exploitation of existing on-campus courses. This would enable senior leaders at University A to create integrative and synergetic value across exploratory and exploitative activities.

From a strategy point of view, university leaders pursued both cost-leadership and differentiation strategies simultaneously, attempting to increase efficiency through the extension

of the "One University – Student First" projects and to differentiate its courses through various initiatives, such as online learning, alternative entry pathways, new courses, and applied research. The university differentiated its courses in terms of teaching quality, generic skills, and overall graduate satisfaction which had been awarded 5-rating star by the Good Universities Guide. However, in the face of a resource constrained environment, the university tended to focus on cost leadership or efficiency rather than a differentiation strategy due to the significant reduction of government funding.

In addition to strategy, University A had *organizational structures* that supported the integration of learning. The senior leadership team worked together with the university council to determine the overall strategic direction. Significant changes to the organization's strategic direction must be approved by the university council. Periodical meetings were held to discuss exploration and exploitation activities that the university wanted to pursue.

Within the executive level, the integration was enabled through formal meetings that encouraged conversation, knowledge-exchange, and collaboration among the members of the senior management team:

> *We have a structure called VCPMG which is the Vice Chancellor's Planning and Management Group. We hold formal meetings every two weeks where we discuss different opportunities and put up cases for change, or we just really talk about what's going on across the university. And that's from both the support side and the faculties' side, so we understand what the issues are in the operations, faculties and schools, and we understand what the issues are in the support side, the service centers.* (SE1)

University A also has a technology governance team called "BIG composition" comprising representatives from different areas within the organization, such as schools, research, teaching and learning, corporate services, and student services. With this technology governance team, University A expected increased communication and coordination in its IT governance. Communication between IT services and its clients was seen as one way to resolve the tension between IT services and the differing needs of its clients:

> *We have a limitation on budget, we have a limitation on human resource, and we can only do so much, so it's about getting everybody to understand that we've got to do the most important things, but what those things are coming from them. So, I think it's involving them in the decision-making process through the governance framework.* (SM1)

Through consistent dialogues between individuals and/or groups who had conflicts, a shared understanding and collective actions could be achieved in most cases.

The centralization approach of University A through the "One University" initiative has also enabled synergy across the different units. This centralization has made the university more ready to implement further centralization initiatives to increase efficiency, as illustrated in the following comments:

So our central nature and our already centralized approach made it easy enough to work through a process to do more centralization. (SE2)

However, if University A wants to pursue further centralization by removing faculties or reducing schools, the university leaders need to consider it very carefully. Shattock (2010) argues that removing faculties or reducing schools will not eliminate the inherent tension between the need for strong central direction and a desire for devolved responsibility and incentives. Christopher (2014) identified this as the tension between corporate cultures and collegial and autonomous cultures commonly found in Australian public universities. In order to balance this tension, University A's leaders need to consider what will be delegated to ensure that schools can meet their teaching and research responsibilities whilst taking account of the wider strategic considerations and the external environment as suggested by Shattock (2010).

In other instances, the university also had temporary cross-functional teams consisting of staff from different organizational units that worked collaboratively on innovation projects, such as new online courses. Members could move back and forth between their projects and their organizational units allowing knowledge between two activities to flow and in turn would facilitate integration and coordination to happen between their projects and their organizational units.

Leaders at University A also tried to create an *organizational culture* or climate that promoted the integration of learning by communicating the "One University – Student First" philosophy consistently and repetitively to all university members. A shared vision embraced by most organization members could help the university integrate incongruent views and balance the organization's diversity. In this way, University A strived to create an ambidextrous culture (task-related diversity and shared vision) in which organizational members could have different perspectives, skills and knowledge but they also needed to have a shared vision that enabled them to work collectively to achieve the organization's common goals as suggested by Wang and Rafiq (2014). This is one example of how University A pursued contextual ambidexterity. However, integrating a vision through a bottom-up process was often difficult to achieve due to the university members' different interests, as indicated by one of the senior leaders at University A:

It's natural for people just to think about what they do but you've really got to start thinking of the whole university because to implement some of the ideas is expensive and we can't afford to be doing that in small pockets. I think the cultural change that's required is probably the biggest challenge. (SM1)

In addition, due to the existence of the collegial and autonomous culture of academics at University A, some academics tended to use their academic freedom to challenge the status quo. While the professional autonomy was useful to promote more innovative ideas in the phase of intuiting and interpreting, it was often counterproductive to the integration process. In

particular, the collegial decision making process and its extensive consultative feature that cascaded from and up to the university council often slowed down the decision making process. This was expressed by one of the senior leaders at University A:

We have a lot of bureaucratic processes, a lot of committees, so there are always papers to be filled out, signatures to be obtained, committees to take it to, to review for consideration. You take it back, you then review what you re-submitted then it goes up through the chain. It takes time and paperwork. (SE5)

Being too consultative and bureaucratic, the consultative process was often in tension with the corporate culture as it affected the effectiveness and the speed of decision making which was often needed in a rapidly changing environment. While a lengthy consultative process could potentially hinder the pursuit of innovation, the collaborative culture was one that was valued by leaders at University A. Such a culture could facilitate the integration of ideas and the implementation of significant changes:

The main thing we have at [University A] is a very collaborative culture… we're not a change-averse place and we're a very resilient place, so we can make quite significant change and people will accept it and move on as long as they get reasonable justification for it. So we tend to have a pretty good culture in terms of how we are as an organization; we're friendly, nice people and everyone gets on pretty well for the most part, and I think that all helps to allow change to happen. (SE2)

Leaders integrated disparate views and resolved conflicts among university members through rational discussions supported by valid arguments and data, as shown in the following comment:

The only way that you can resolve conflict is by putting forward an absolutely strong waterproof argument as to why change is needed. And often that's driven through data, data to show if we don't move these are the figures. (SM2)

In this respect, leaders at University A strived to balance the tension between the collegial and autonomous culture and the corporate culture. The collegial decision making process and academic autonomy in this university was to some extent operating within a corporate culture in which the senior leadership team and the university council (including the relevant committees) worked collectively to bring greater accountability for the range of functions academics performed and by which the university was to be governed.

The process of integration also involved the allocation of *organizational resources*. To resolve competing interests for investment options, University A has a framework to manage a consistent approach when dealing with its resources. It has the Strategic Asset Management Forum where the senior executive group would review investment options. University A refined its "Enterprise Resource Allocation Model" that helped managers prioritize initiatives based on the cost, potential financial return, and strategic fit with the university's goals to enhance its capability in making resource allocation decisions in resource-constrained circumstances, as illustrated in the comment below:

We've made that decision based on a principle of profitable growth. As we grow we have structures in place for prioritizing on a binomial index, of looking at different opportunities and measuring them against the strategic priorities of the university and its vision and values on one parameter, and on the other parameter, looking at the outcomes that investment would provide. So we prioritize regularly various opportunities against those two parameters. And that's the way we will resolve conflict, is through fairly deep analysis of what individual opportunities are going to provide. (SE2)

In addition, to help the integration process in the development of a new course, an interview respondent mentioned that the curriculum of a new course called Master of Professional Communication was developed by combining or upgrading existing competencies and/or resources across disciplines in communication:

Well I think the tensions will be around which disciplines are represented, but as it turned out, if you look at the curriculum, all the disciplines are represented. You have public relations, you've got advertising, you've got communications, you've got media… and journalism. So all the disciplines actually were represented in terms of communication, [in the] Master of Professional Communication in the final curriculum. (SR2)

In terms of IT, University A has been striving to integrate its information systems to allow resource sharing and ultimately improved efficiency:

We undertook a major transformation program called "IT@[University A] for the Future". The change is considerable. We've changed the whole operating model of delivery of IT Services, we've put in place governance, we've developed enterprise architecture to put out a linkage between technology, investment and business strategy, we've restructured the IT Services Centre itself, and we've brought into the IT Services Centre some of the IT functions that were being done outside the IT Services Centre. (SM1)

However, while the centralization of common IT resources can enable resource sharing among organizational units within the organization, leaders at University A need to be aware that the decentralization of very specific IT requirements for particular organizational units is needed to allow them to pursue technological-based innovation as suggested by Weill and Ross (2004).

Overall, University A had a relatively high level of integration of behaviors and this should allow for the implementation of radical changes, such as significant structural changes to increase efficiency in response to anticipated reduced revenues. Senior management used power and authority to achieve integration in a top-down manner when collective actions were difficult to be achieved voluntarily. However, the senior management's top-down approach at University A seemed to affect organizational members' perspectives of the senior management leadership negatively. As such, these leaders need to prepare their employees for changes by spending sufficient time explaining the change and involving them in the process of change implementation. In a study of Australian universities, Shah and Nair (2014) argue that consultation with staff across the university can improve the inclusion of the voice of staff and other stakeholders which in turn amplify the ownership of a strategy or plan. Therefore, the

planning of changes at all levels at University A should involve more consultations with internal university stakeholders to identify inter-dependencies, constraints, and opportunities for collaboration between organizational units to promote integration.

The researcher discusses the institutionalizing phase of 4I organizational learning at University A in the following section.

5.3.4 Institutionalizing

In the institutionalizing phase, the role of leadership at University A was to make knowledge available for exploitation which included the implementation of new changes in systems, structure, procedures, and strategy. At the time of the interviews, University A was to appoint a new Vice-Chancellor in early 2015 and some respondents felt that the Vice Chancellor's succession would have significant impacts on its strategic direction and the implementation of existing strategies, as illustrated in the following comments:

> *We'll have a new Vice-Chancellor so leadership will be a factor in what the new Vice-Chancellor wants to do and what he or she considers to be the issues they need to address and what direction they want to move in as a team.* (SE3)

> *We'll get a new Vice Chancellor. He will take us in new directions; he will have new ideas and concomitant with that though, everyone's maybe just a little bit nervous about what's going to happen, because you don't know, an unknown quantity is coming on as our captain, and so you're not quite sure what changes will be made.* (SM1)

While such a change could be viewed as creating some uncertainty, some at University A felt that it had the necessary structures in place to deal with the change of Vice-Chancellor:

> *In my view we've got a very strong executive team. I think that having a new Vice-Chancellor is going to put some challenges as always when a new CEO comes in, but the executive team is very strongly aligned and works collaboratively and quite well. So the elements are in place where we can have quite strategic discussions and make decisions that will allow us to adapt in the future.* (SE1)

The new Vice Chancellor was appointed and he started his leadership role by directly soliciting inputs from frontline staff and students to understand University A's opportunities and challenges better. The responses were then used in consultation with the university council to clarify where changes were required. University A's stakeholders agreed that it needed to refocus on research and re-energize its international recruitment. In line with the "One University" philosophy, the new Vice Chancellor believed that University A needed to have structural changes to enable it to respond to the external environment quickly. To improve communications and facilitate devolved decision-making, he has moved to reduce bureaucracy by flattening the structures through the removal of faculties and the reduction of the number of schools. In addition, he has sought to elevate the university's research performance by securing adequate funds to attract renowned researchers to bring in new skills and insights to boost

research activities. The proposed structural changes would also allow schools at University A to run the recruitment drive for international researchers. While the new Vice Chancellor continued the exploitation of the "One University" philosophy by flattening the structures and reducing bureaucracy to make it more manageable from a corporate perspective, he also explored the possibilities of improving the university's research performance. Exploration of new initiatives brought by the change in the university's top leadership has led to the adjustment of existing strategies.

In terms of *strategy* and institutionalizing, leaders at University A assigned staff at different organizational levels to be responsible to carry out the action plans and specified the performance measures and targets (relevant Key Performance Indicators – KPIs), and scheduled the time to complete the tasks. In addition, University A used external reference points, such as formal benchmarking measures, to analyze its own performance, outputs and processes. According to the University Planning Cycle document, the university's strategic priorities are cascaded through the levels of the university to the individual work plans of the university's staff. Leaders may have several innovation strategies that occurred simultaneously but these strategies should be integrative and synergetic towards the achievement of the university's purpose, vision, and strategic priorities. Leaders institutionalized lessons learnt related to strategy in the university's long-term, medium-term and short-term strategies:

> *There's a rolling strategic plan of five years for our university. Then, there's a three-year rolling plan for functions, so the Deputy Vice-Chancellor Teaching and Learning will have a functional strategic plan and that will come back to a service center which has an operational plan for a year.* (SM3)

The medium to longer-term strategies (3 years or more) need to be approved by the council and adjusted annually based on progress and changing circumstances. Changes in the external environment need to be accommodated in the institutionalizing process. At the time the study was undertaken, the Australian higher education sector faced uncertainties as universities awaited the federal government's next move in its programs to cut direct funding, deregulate fees, and embrace private providers. While the Federal Government's deregulations were rejected for the second time in March 2015, the Government appeared intent on passing the proposed higher education reform (Lewis, 2015). In this respect, University A tried to pursue strategic flexibility to enable it to anticipate dynamic environmental changes due to the political uncertainties. In 2014, the university tended to emphasize efficiency and teaching productivity through the Vision of Growth program. In 2015, with the appointment of new Vice-Chancellor, the university changed its strategy again by refocusing on research and re-energizing its international recruitment. The university still emphasized the implementation of a cost-leadership or efficiency (exploitation) strategy since the leaders anticipated more reduction of government funding in the near future. However, while previously the university focused

mainly on teaching quality, the university started to pay more attention to its research performance as a point of differentiation.

University A's leaders initiated the appropriate *organizational structures* for institutionalizing innovation strategies. The university seemed to be more flexible in implementing significant changes due to its centralization approach, as illustrated in the following comment:

> *I found that this university, relative to other universities, has a very strong capability to achieve enterprise by change. Now I say that because the "One University" structure allows us to take an enterprise-wide view of matters, but also because this university has an extraordinarily high alignment to its vision, its purpose and its values.* (SE1)

In line with the "One University" philosophy, further centralization initiatives were realized to improve coordination and efficiency. For example, based on the 2014 university annual report, international student admissions and domestic student admissions are both now administered by the Student Services Centre and average application turnaround times have decreased by 87% (22.7 days to 2.7 days) since 2013. While there was a tendency to pursue centralization at University A, Christopher (2014) argues that decentralization is still required to manage a body of academic experts within different disciplines in different schools. One way in which decentralization occurred at University A, was to allow schools to recruit their own international researchers. In addition, decentralized schools could be more agile in responding to the environmental or external changes, such as student demands in research supervision, as confirmed in the comment below:

> *I do think that the Graduate School has definitely been working towards adjusting to a changing environment in research supervision and has come up with some innovative ideas. Not necessarily ones that will always work, but certainly innovative ideas, and attempted to address the lack and gaps that need doing.* (AC1)

This decentralization was complemented with high formalization to ensure successful implementation and compliance with the university's standards.

Leaders at University A created an *organizational culture* that enhanced the dissemination of institutionalized knowledge in the institutionalizing phase. While university members had a relatively open and collaborative culture that could support feeding back the institutionalized knowledge from organizational to individual levels, there were communication problems in some areas within University A, as illustrated by the following comment:

> *Let's say some new guidelines come out, or a review for a particular funding scheme, we need to communicate that effectively to the researchers. There are always challenges around that because we typically go out through ORI Notices. It is a global email to all the researchers who sign up for it, but not everyone will read that.* (SE5)

It appears that new knowledge was often not well-communicated across the university so that most university members were not aware of the new knowledge. Therefore, leaders should

communicate new changes with relevant areas or members and get their feedback to develop interactivities between members and leaders that enable successful implementation of changes. The university should not rely on corporate portals and emails in disseminating new changes since the interviews with the university's respondents revealed that they often did not read these emails or check portals. As a result, some academic staff did not know that there were programs available to support them in doing their teaching and research responsibilities, as illustrated in the comment below:

> *Well obviously they're not there for the staff because I don't really know what they do, to be honest. I have no idea what they do. I wouldn't know.* (AC1)

In other instances, the feedback process of the institutionalized learning from the service centers to academic staff did not flow well because the staff lacked time to participate in the internal training and/or professional development programs, as confirmed by one of the service center's members:

> *You will find that a lot of time from our academic staff, that they will say, "I don't have time for this training." And they would like to pick up the phone and talk to you on the phone instead of going to that course to get just that little bit of help.* (SM3)

Therefore, the service centers need to consider the time constraints in delivering internal workshops or training for academic staff. They also need to seek input from academic staff about their need for new skills so that the training could be targeted to the areas of skills requiring improvements and the staff would be motivated to join the training because they need it.

In addition, University A often faced challenges in the implementation of new initiatives due to lack of communication in the initiation phase of innovation, as shown in the comment below:

> *I don't think we've got a good handle on change management in the organization. People develop systems somewhere but don't take cognizance of all the stakeholders that will have one line in that system of training. A lot of times, or seldom, I don't know which way to go, they don't even talk to those who need to provide that training at the end of the day. We're bad at our communication.* (SM3)

The 2014 internal staff survey showed that in general only half of the respondents had positive views on change and innovation at University A. Furthermore, only 31 per cent of survey respondents agreed that the university had been able to cope with change. The disparity between what the University A's leaders believed and what its staff felt about how change was handled indicates that University A needs to enhance communication and coordination among the relevant internal stakeholders by involving them in the planning stage. University A also may need to feedback the institutionalized knowledge through more participative activities and other communication initiatives, such as newsletters, workshops, training, or meetings.

In the institutionalizing component of 4I organizational learning, University A applied strict adherence of *resource* allocation in the implementation of new initiatives, as mentioned by one of the university members:

> *We have an approved budget for a project that has tolerances within it... plus or minus of around ten percent, and anything above that would require an approval process according to the delegations of the university. The project boards manage both the scope and the budget but typically, if scope creeps out budget creeps out. It's not often that you can do one without the other.* (SM4)

Leaders of University A also strived to institutionalize investment in infrastructures in such a way that enabled the organizational members to both pursue exploration and exploitation simultaneously. For example, the university has been striving to develop IT flexibility to enable it to meet changing IT requirements necessary for achieving its strategic goals:

> *We'll only invest if they will facilitate the change that is required in the business model of the university, rather than somebody has an idea that this will be a good thing to do. I think our model of building in flexibility is going to be very important in the future.* (SM1)

The strategic initiatives for developing IT flexibility included the institutionalization of cloud services. Organizations need to select a cloud service provider carefully due to security threats to cloud services (Ouedraogo & Mouratidis, 2013) and the difficulty of changing cloud service providers due to lack of interoperability (Gonzales-Martinez, et al., 2015). University A worked with a supplier to institutionalize the organization-wide adoption of cloud services.

In the institutionalizing process, Schilling and Kluge (2009) propose that inadequate management skills in providing consistent and systematic implementation can prevent organization-wide institutionalization and adoption of innovation. One of the interview respondents identified project management skills as necessary skills in the process of institutionalization:

> *I try and give people the opportunity to develop their skills around project management because that's really where you do need a lot of those skills when you're talking about anything innovative, because it's not just about the idea, it's also how are you actually going to implement it* (SE4)

As such, leaders of University A tried to provide training in project management to ensure successful implementation of innovation in this university.

In general, the institutionalizing process of radical changes at University A was enabled by centralization and strong leadership with clear vision. While the university members who stayed in the organization obeyed the edicts from the top management to implement the changes, they did not necessarily change their thinking. When these changes proved to demonstrate good results, these university members would gradually embrace the changes and be more ready for further implementation of changes. However, the process of radical changes in University A

could have been better if leaders provided clear and solid justifications for changes and communicated them to all the relevant stakeholders effectively in the earlier stage of planning to increase their commitment towards the implementation of changes.

5.4 Chapter summary

University A has implemented many changes that could be associated with innovation. Most innovations at the university could be associated with exploitation because they were intended for increasing efficiency, such as process improvements. However, some process improvements could be associated with exploration because they involved significant changes in the university's existing business processes. For instance, the university has undertaken the structural reform as part of the "One University – Student First" initiative. It also introduced the "Vision of Growth" to increase efficiency and to adopt appropriate business capability models to generate more revenues and enrolment growth. This administrative innovation also stimulated the adoption of technological-based innovation intended for improved efficiency, such as cloud computing.

University A also initiated product innovation that could be linked with exploration, such as the introduction of a few new courses. In a resource constrained environment, leaders at University A tended to prioritize the development of new courses that recombined or upgraded existing competencies. In this way, University A strived to achieve organizational learning ambidexterity and in turn developed strategic flexibility by increasing its efficiency and differentiating its courses to enable it to deliver courses which have competitive prices and unique features. This strategic flexibility was very important in the face of political uncertainties that may affect the funding framework and the competitive landscape of the domestic student market. The university anticipated reduced revenues due to significant reduction in government funding and the "half cohort". The proposed higher education deregulation would increase competition in the domestic undergraduate student market and could reduce the university's budget significantly. Although the Federal Senate had rejected these educational policy changes in December 2014, the Federal Government continues to push for reform in the higher education sector. Due to large budget deficits, the Federal Government froze the Commonwealth grants funding for two years from 1 January 2018 which has practically put an end to the demand-driven system while not directly capping Commonwealth-supported student places (Norton, 2018). This will force Australian universities to operate more efficiently in the coming years and may require their leaders to pursue more radical process improvements and cost-containment strategies.

In examining University A's approaches to organizational learning ambidexterity, overall, University A tended to focus more on a cost-leadership strategy and increased efficiency (exploitation) rather than on a differentiation (exploration) strategy in the resource-constrained

environment it faced. In this sense, organizational learning ambidexterity in University A can be associated with higher exploitative learning complemented with lower exploratory learning.

Following Berson et al. (2006), the process of intuiting and interpreting at University A could be linked to exploration of new knowledge (or idea generation) but the institutionalizing phase could be associated with exploitation of existing knowledge (or idea implementation). Leaders strived to stimulate organizational members' creativity and encourage variety of ideas during the intuiting and interpreting phases through a number of ways, such as dedicated functions for exploration. Leaders used the "One University, Student First" approach to integrate different perspectives through a shared common vision. Leaders also facilitated the organization-wide institutionalization and adoption of innovation.

The above organizational learning process has also demonstrated how leaders provided internal contextual support to achieve ambidexterity via structural and contextual approaches. The university has adopted a structural approach by having separate functions for exploration such as the Strategic Business Development Unit. This structure provided space and resources for new initiatives to get started particularly in the initiation of the innovation process (intuiting and interpreting). These exploratory initiatives were then integrated by the executive level through a mechanism called VCPMG (Vice Chancellor's Planning and Management Group). Since the integration at the senior management level was not sufficient to facilitate coordination between relevant organizational units at lower managerial levels to implement new exploratory initiatives, the university also strived to pursue contextual ambidexterity to enable every member of the university to pursue both exploration of new ideas and exploitation of these ideas in the university's organizational learning process. One of the examples of the contextual approach is where leaders of University A allowed divergence of knowledge at the individual level in the initiation phases of innovation (the intuiting and interpreting phases) by having a collegial and autonomous culture. However, they encouraged integration of different perspectives at the group and organizational level in the innovation implementation stage (the integrating and institutionalizing phases) by encouraging the corporate culture through the "One University – Student First" philosophy. While a temporal approach cannot be clearly seen in the 4I processes above due to its cyclical nature, it did happen in University A. For instance, University A achieved temporal ambidexterity by pursuing short bursts of exploration in the acquisition of cloud computing followed by long periods of exploitation in embedding of cloud computing into all its operations. The process of organizational learning in University A could be summarized in Table 5.2.

External context	How leaders adjusted the internal context (based on the phases of 4I Organizational Learning)		Type of Innovation pursued and approaches to ambidexterity used

• **Competition**
  o Increased domestic competition due to the "half cohort", the student-demand-driven system, and the proposed education reform;
  o Stronger competition from international counterparts
 	
• **Customer demand**
  o Temporary decrease of domestic students due to the "half cohort"
  o Increased international sponsored research students
 	
• **Development of technology**
  o Online learning and cloud computing
 	
• **Strategic partners**
  o Assistance in delivering technological-based innovation (i.e. full adoption of cloud computing) and administrative innovation (i.e. restructuring)
 	
• **Government or regulations**
  o The proposed education reform involving significant reduction of government funding
	Intuiting	• Leaders stimulated individual organizational members' creativity by developing their competences and motivating them to innovate through the creation of a conducive working environment:
		  o Strategy: setting strategic priorities in engagement, world-class education, professional graduates, research and sustainability
		  o Structure: having dedicated units for exploring (e.g. Strategic Business Development Unit to improve revenue growth or student enrollments); more decentralized structures of "academic units"
		  o Culture: tolerating a certain degree of risk-taking behaviors and fostering values of openness to new ideas and thinking "outside the box"
		  o Resources: encouraging innovation aimed at increasing efficiency due to the high pressure of less government budget for higher education; collaboration with external innovation partners to pursue innovation (e.g. cloud computing and structural reform)
			• **Innovation**
			  o Mostly process innovations linked to efficiency (exploitation) i.e. incremental business process improvements; however, few radical technological-based innovation (i.e. cloud computing) and radical administrative innovation (i.e. structural reform) can be associated with significant process improvements (exploration)
			  o The introduction of some new courses linked to differentiation (exploration)
			
			• **Approaches**
			
			  o Overall: focusing on a cost-leadership strategy and efficiency rather than on a differentiation strategy
			
			and also
			
			  o Temporal: the focus shift from the exploration of new technology (i.e. cloud services) in the first-time adoption, to exploitation of the technology through the refinement of its use
			
			  o Structural: dedicated units for exploration (e.g. Strategic Business Development Unit)
			
			  o Contextual: the encouragement of putting forward varieties of ideas in the intuiting and interpreting process and the integration of views in the integrating and institutionalizing process through the use of "One University, Student First" approach

	Interpreting	• Leaders provided a shared interpretation for guiding innovation activities and facilitated constructive dialogues to allow the acceptance of new ideas and insights:
		  o Strategy: communicating the above organization's strategic priorities and emphasized the "Vision of Growth" initiatives
		  o Structure: introducing new programs (i.e. Vision of Growth) to initiate new thinking related to organizational strategic objectives; appointing new personnel to bring new interpretations (i.e. a corporate approach)
		  o Culture: promoting a knowledge-sharing culture through various ways, such as formal and informal meetings, the use of Yammer, and values of respect; however, workloads tended to impede organizational members to interact and collaborate
		  o Resources: communicating a new context for interpretation related to resources (i.e. understanding the resource constraints and interdependency that limited the pursuit of innovation)	

	Integrating	• Leaders guided the integration of new and existing knowledge by facilitating a shared understanding at both the group and organizational level to allow for coherent and collective actions:
		  o Strategy: focusing on cost-leadership or efficiency due to significant reduction of government funding but striving to adopt a differentiation strategy i.e. introduction of a few new courses
		  o Structure: using regular leadership team meetings (i.e. VCPMG) at the executive level; BIG team for IT governance; cross-functional teams at lower levels of management
		  o Culture: communicating the "One University, Student First" philosophy	

External context	How leaders adjusted the internal context (based on the phases of 4I Organizational Learning)		Type of Innovation pursued and approaches to ambidexterity used
		to achieve integration of views and collective actions o Resources: prioritizing the most reasonable and feasible initiatives in resource-constrained circumstances using the "Enterprise Resource Allocation" model; focusing on efficiencies and compliance with the government's standards and regulations (e.g. TEQSA)	
	Institutionalizing	• Leaders facilitated the organization-wide implementation and adoption of innovation as well as institutionalized new knowledge in such a way that enabled the simultaneous pursuit of exploration and exploitation: o Strategy: developing and monitoring strategies to implement changes by creating necessary structures (e.g. the new Vice Chancellor secured adequate funds to attract renowned researchers and decentralized the recruitment for international researchers to the school levels in order to elevate the university's research performance) o Structure: using different structures for different parts of its organization (e.g. adopting centralization to implement radical and organization-wide changes (structural reform) and decentralization with high formalization to implement schools' initiatives) o Culture: fostering an organizational culture that supported innovation at the organizational level (e.g. facilitated communication and coordination to disseminate institutionalized knowledge) o Resources: developing resource and coordination flexibility (e.g. investing in cloud computing, training in project management)	

Table 5.2: The process of 4I Organizational Learning (OL) at University A

Chapter 6: Police Academy A - Case analysis

6.1 Introduction

In this chapter the researcher examines data from the mini case study of the Police Academy A, which is the training and education center for police officers in State A, one of eight jurisdictions in Australia. The State A Police has been operating since the 18th century but Police Academy A was formally opened in 2002. According to the 2015 State A Police annual report, the police agency had 7,841 employees (police officers and staff) throughout the state with 350 staff assigned to academic development. Police Academy A was chosen in this study because it had been awarded the National Employer of the Year (Australian Training Industry Award – Government) in 2008 for delivering innovative in-service training in the areas of use of force, investigative practices, and driver training. The training facility in this Academy is equipped with cutting-edge technologies that include an interactive tactical training simulator and a full-scale scenario village. It was also chosen for this study as little research has been done about how innovation can be facilitated in police organizations (Darroch & Mazerolle, 2013). While the chapter centers around Police Academy A, the fact that much of its operations are directed to a large extent by the State A Police means that some of the discussion and analysis in this chapter will include relevant issues at the State A Police level.

The State A Police set three main stages that applicants need to undergo to be appointed as a constable: the recruitment process, Academy training, and probation. First, applicants need to fill out an application form and undertake the assessment process. Second, selected applicants or recruits must attend a 28-week on-campus training course in Police Academy A. The training covers the areas of physical training, legal studies, weapons and tactical training, scenario village, parade marching, interview techniques, and electronic systems. Training for all new recruits in Police Academy A is based on a nationally accredited standard. As a Registered Training Organization (RTO), Police Academy A can provide a certified or accredited Diploma of Public Safety (Policing) which is recognized as a national Vocational Education and Training (VET) qualification. Recruits can graduate from Police Academy A as 'non-operational', 'operational with some documented areas for improvements', and 'operational'. 'Non-operational' means incompetent in some areas of weapons and use-of-force. Lastly, recruits must undertake an 18-month probationary period of on-the-job-training after they graduate from Police Academy A.

The State A Police was at the beginning of a reform process when the researcher interviewed the respondents at Police Academy A. Being an integral part of the State A Police, the

innovation process in Police Academy A had been greatly influenced by the reform process that was happening across the whole police agency at that time. The data were analyzed from data gathered from the corporate website, press releases, and face-to-face interviews with five of the academy's staff in October 2013. Table 5.1 provides a list of participants who were interviewed.

No	Participant's position
1	Senior Manager
2	Manager 1
3	Manager 2
4	Manager 3
5	Manager 4

Table 6.1: Participants' details

(Note: Managers 1 to 4 are the senior leaders of Police Academy A; however in order to preserve anonymity as prescribed under Ethics guidelines, their portfolios are not revealed)

The researcher commences this chapter with an identification of the external context faced by Police Academy A. The researcher then investigates how the external context has influenced how leaders of Police Academy A adjusted the organization's internal context to facilitate organizational learning for innovation. Senior leaders play a critical role in managing exploratory and exploitative innovation (Benner & Tushman, 2015; O'Reilly III & Tushman, 2013). As in the previous two mini cases, the 4I framework (Crossan, et al., 1999) is used to understand the organizational learning processes in Police Academy A under the categories of intuiting, interpreting, integrating, and institutionalizing. In examining Police Academy A's learning processes for innovation and the tension faced by its leaders in seeking to balance exploration and exploitation, the researcher uses Berson et al.'s (2006) proposition that exploration stresses the 4I learning processes of entrepreneurial intuition and interpretation, whereas exploitation emphasizes the learning processes of institutionalization. The researcher concludes this chapter by identifying the approaches to organizational learning ambidexterity that the Police Academy has pursued in response to its external context.

6.2 External context

Police Academy A's external context is investigated in terms of competition, customer demands, technology development, strategic partners, and government. In the literature review chapter, the researcher identified these constructs as influencing the organization's internal context and the requisite organizational learning required to support innovation.

The demand for policing services has been increasing and has become more complex but the state government had increasingly reduced the budget for police. As a result, the academy had to formulate strategy to deliver high quality education and training with limited resources in order to enable state police officers to perform their policing services. It strived to improve its recruitment and training practices to be more consistent with community policing practices (by

encouraging local communities to participate actively in crime prevention) as mandated by the policing reform program in 2013. In addition, the academy adopted technological-based innovation, such as on-line learning, to increase efficiency significantly. Most innovations in the academy were linked to efficiency (exploitation) i.e. incremental process improvements. However, few radical technological-based innovation (i.e. an interactive tactical training simulator) and radical administrative innovation (i.e. structural reform) in the academy can be associated with significant process improvements (exploration). The academy also differentiated its services through the provision of updated education and training that enabled frontline police officers to provide more focused and efficient policing services. In this way, the academy strived to pursue both cost-leadership and differentiation strategies simultaneously although it tended to focus on efficiency in the face of a resource-constrained environment.

In the following section, the researcher examines how competition affected innovation in the police academy.

6.2.1 Competition

Competition can push organizations to innovate to achieve higher efficiencies (Desmet & Parente, 2010). Because Police Academy A is a central police training provider in State A, it does not have direct competitors. Greasly (2004) argues that the police force, as a public organization, is not in the competitive market so that competitive pressure for innovation is relatively low. However, it faced competition from other industries in terms of attracting enough recruits to meet targets approved by the State Government, especially in specific demographic areas. According to the State Auditor General's Report in 2012, Police Academy A was struggling to recruit the required number of police officers and was unable to recruit more officers who were female, Aboriginal, or were from culturally diverse backgrounds to meet its diversity targets. Wilson (2012) argues that diminishing sources of recruitment can be caused by less qualified applicants, less preferences for careers in policing, more competitive processes to become qualified police officers, broadening skill requirements for police officers, uncompetitive benefits, and organizational characteristics that cause attrition. Police Academy A was successful in recruiting an additional 500 officers under the 2008 State election commitment. However, it appears that it was having difficulty recruiting an extra 550 over 4 years targeted under the 2013 State election commitment despite an allocation of AUD215 million from the State Government. This could also be due to the State Government's new policy of linking pay rises to inflation. To minimize this problem, Police Academy A was required to work with a professional marketing agency to launch recruitment marketing campaigns.

In addition, although Police Academy A is not in the competitive market, what has been done by other police jurisdictions in other states or even countries could indirectly influence Police

Academy A to pursue innovation through benchmarking. However, organizations need to contextualize the lessons learnt from benchmarking to fit their organization-specific contexts (Hobday, 2005). As a public organization, the State A Police department is required to demonstrate its accountability with some of its performance indicators often benchmarked and the department is often asked to improve its processes to achieve higher efficiencies. Compared to other Australian police jurisdictions, general satisfaction with services provided by the police in State A was in the bottom three in 2012-13 (NSCSP, 2014). Inquiry to this matter needs to include how the training and education process is undertaken in Police Academy A. The State Auditor General in 2012 reported that training by the academy needed to be improved so that constables could have the required skills and competencies to do policing tasks. Police Academy A has conducted its own benchmarking with other police jurisdictions to learn best practices in police training to improve its education and training courses:

> *We've gone to other jurisdictions around the world, especially United Kingdom, to see what they're doing over there, to see whether what they're doing there has some application for what we're doing here.* (Manager 4)

> *The external factors are just benchmarking, generally trying to keep abreast with what other policing jurisdictions do in terms of their best practice.* (Manager 3)

Benchmarking enabled Police Academy A to map its position and to identify areas for improvements (these improvements will be discussed in later sections).

In conclusion, competition did not affect innovation at Police Academy A directly because it is the only police training provider in State A. Nevertheless, Police Academy A still faced competition in attracting enough recruits to meet the State Government's targets. The Academy through benchmarking also considered what other police jurisdictions did in order to improve its training and education courses.

6.2.2 Customer demands

Customers' demands can drive innovation in service organizations (Ngo & O'Cass, 2013). In the case of Police Academy A, community expectations influence the required skills and competencies for recruits. The recruits themselves also have needs that the Academy should be able to meet to enable it to provide the State A Police with qualified police officers for its policing tasks. Community expectations and the nature of the community being policed affect Australian policing functions (Findlay, 2004). Communities across Australia are diverse such that expectations for police functions vary and certain situations in different communities require different policing approaches. For example, according to the 2014 National Survey of Community Satisfaction with Policing (NSCSP), forty percent of Western Australian respondents show concerns with illegal drug problems in their neighborhood, more than just the twenty eight percent of Australian Capital Territory respondents. This and other state-specific

security problems contribute to the variety in the public's perception of feeling safe across states in Australia. For instance, fifty five per cent of respondents in Tasmania are more confident of walking alone in their neighborhood at night compared to just forty two per cent of respondents in Northern Territory. Based on the 2014 Annual Report of State A, community safety is used as one of the Police Key Performance Indicators for measuring police performance. Thus, the police force needs to take customers' demands (its community expectations), into account in developing policing services that can better meet the needs of the community (Baker & Hyde, 2011).

Police Academy A must be able to provide training to develop the required skills and competencies for frontline officers so that State A Police can meet these policing demands. However, Police Academy A did not respond to the evolving policing demands well. In 2012, the State A Auditor General reported that for some probationary constables, Academy training was inadequate. Some supervisors at the police stations where probationary constables did their on-the-job training had concerns about Police Academy A's training courses. Forty percent of supervisors who participated in the survey believed that the training at Police Academy A was not sufficient to prepare the probationary constables with the required skills and competencies. This highlighted a gap between Police Academy A's training and real police work. To minimize the gap, one of the respondents highlighted the importance of having an updated training needs analysis, as the last one was conducted in 2003:

> *What happens is we tend to be very reactive. If some legislation changes or some processes change, then the academy gets notified of that and we tack that onto the end and if the training's becoming too long, then we take something out... There should be a processed way to deal with training and education, and the first process is always training needs analysis. Once you've got that training needs analysis you can then go off and develop it and an area would develop it accordingly.* (Manager 3)

In addition, Police Academy A should collaborate with other areas within the State A Police agency to be able to identify policing demands so that it could better prepare recruits for policing tasks. For instance, the State A Auditor General in 2012 recommended that Police Academy A improve its communication with police stations where probationary constables undergo their on-the-job-training in order to investigate the gap between existing Academy training and current policing demands. As an RTO (Registered Training Organization), Police Academy A is regularly audited by the Training Accreditation Council (TAC) and is required to maintain a nationally accredited standard for its training curriculum. However, there is some "agency specific" training related to the state legislation, policies, and procedures that are unique to the state that recruits need to have. In addition, State A Police applies a set of policing priorities which Police Academy A needs to address in its agency specific training.

Similar to other police jurisdictions around the world, the Australian Police is required to meet increasing policing demands that have resulted from population growth. According to the Australian Bureau of Statistics (2014), the population in Australia has reached more than 23 million people as of March 2014. The population of State A grew by 2.5 per cent during the year ended 31 March 2014 to more than 2.5 million people. The growth rate was the highest among other states in Australia. As such, the State A Police needs to anticipate the policing demands in growing areas that are scattered across more than 2.5 million square kilometers. While the State A Government has given approval to recruit more police officers to meet the growing policing demands in the future, State A Police needs to be very efficient in its recruitment due to budget constraints. This is a feature of many police jurisdictions across Australia and worldwide. The Australian Federal Police reported that they faced significant reduction in staff because of budget cuts (C. Smith, 2014), while British policing already had significant government funding cuts (Millie, 2013). The current financial constraints have posed significant challenges for State A Police to deliver high-quality policing services, hence the introduction of the new reform program in 2013 which was intended to make the police operate more efficiently to meet the state's growing population. According to the 2014 State A Police Annual Report, two key principles of this reform are "reducing demand" and "locally focused policing". State A Police have been trying to reduce policing demands by preventing public security problems from occurring. The local community is encouraged to participate actively in crime prevention. In this respect, the state police has tried to be a more community-focused organization suggesting the adoption of more community-policing practices. Scheider et al. (2009, p. 697) stated that "community policing is a philosophy that promotes organizational strategies that support the systematic use of partnerships and problem solving techniques, to proactively address the immediate conditions that give rise to public safety issues, such as crime, social disorder, and fear of crime".

Millie (2013) argues that under financial constraints what composes policing tasks need to be reassessed so that the police can deliver more focused and efficient services. State A Police needs to concentrate on primary policing duties by empowering the community to solve problems that they can manage on their own, as evidenced below:

> *There'll be a lot of functions that police simply won't do in the future, and trying to communicate that to the community, I think it is going to be a big challenge for us, because the community has been so used to us solving all their problems. One of the examples I've heard someone speak about is, if you find a stolen bicycle on your front lawn, you might ring up the police and say "Can you take the stolen bicycle away?" In the future the police will say "You put the stolen bicycle in your garage, put an ad in the local paper and if anybody claims it they can come to your house and pick it up".* (Manager 4)

To be able to do community-focused policing, recruits need to be trained in soft skills that include communication and problem-solving (Chappell, 2008). Based on the 2012 State A

Auditor General's Report, supervisors considered that probationary constables needed additional training in written communication, oral fact finding, and oral communication. In responding to these demands, Police Academy A wanted to provide more training to enhance the recruits' soft skills:

> *We want to deliver more of soft skills. The inherent qualities of a police officer which we want to develop, improve their self-awareness and their empathy and just their emotional intelligence, so that they have greater meaning about why they're police officers. And that leadership previously has always been at the upper levels. Now we want to start it from the most junior constables as well, because they are leaders in their own right.* (Senior Manager)

To implement and maintain community policing, Police Academy A needs to deliver training that can cultivate a culture that values openness, service orientation, innovative thinking, and problem solving rather than a high emphasis on command and control (Murray, 2002). Vander Kooi and Palmer (2014) found that recruits taught using a problem-based learning method felt that their problem-solving and critical thinking skills were improved more than recruits taught using traditional lecture methods. However, a problem-based learning (PBL) curriculum is often considered less efficient than traditional curriculum as it takes a longer time and requires more resources (Makin, 2016). In addition, Vander Kooi and Palmer (2014) found that some topics like cultural diversity and communication were harder to teach and learn using the PBL method as it required a great deal of research, analysis, cooperation, and presentation skills. Facing a resource constrained environment, Police Academy A has not been able to adopt a PBL model successfully:

> *But then if you look at other jurisdictions a lot of them use a problem-based learning model, which is much more resource-intensive. It's a model that's been based in Canada – we don't have that, and we haven't been able to successfully initiate that even though we did do some training in it.* (Manager 3)

Nevertheless, while Police Academy A still uses a lot of traditional learning methods, it is already using some mock training and simulations mimicking "real world" situations and involving some elements of PBL, but it needs to incorporate more PBL in its curriculum. However, some topics such as those around legislation or policy involving rote memorization tasks could be more suitably taught using traditional training methods,:

> *So examples of some of the learning which is done purely around legislation or policy, information which is set in stone - there is no deviation, there's no real interpretation, that is the law and we have to abide by it, that is the procedure of policy and you must abide by it. There wasn't a lot of interpretation, it was just very specific.* (Senior Manager)

In police training, there is a dualistic dilemma between what is taught at an academy and what is being instructed in the field. Recruits often face this dilemma during the probationary period of on-the-job-training when they experience the conflicting issues between what is taught in the

academy and what is instructed by a field training officer. Makin (2016) argues that a police academy needs to adapt the best features of PBL to its curriculum to mediate the paramilitary structure and the inherent dualistic dilemma within academy training. Therefore, Police Academy A needs to recognize the complexity of PBL if the academy wants to adopt more of it in its curriculum.

Another way that innovation can occur in an organization is through the development of new products and services. Ngo and Cass (2013) propose that the development of product and service offerings that suit customer needs requires customer input. According to the 2012 State A Auditor General's Report, Police Academy A had not systematically analyzed the feedback from recruits on its training courses and has not used the assessment results to identify trends and areas for improvements. The interview with one of the respondents in this study shows that this situation continues to prevail:

> *We just individually do that evaluation of a person going, "Well, how valuable was this training to you? What did you think?" But, we don't take that information back, collate and analyze it and then as a whole go "This Hydra [an immersive simulation training system that generates life-like incident situations for training] was successful because we can show you by this data."* (Manager 3)

In addition, according to the report, almost half the recruits and probationary constables trained at Police Academy A demanded more training in the scenario village (such as using the Hydra model), 28 percent wanted more weapons training, and 40 percent more crime scene skills. It was further reported that these areas were where recruits required multiple attempts to gain competency. Thus while Police Academy A has collected some feedback from its recruits on its training courses via surveys, it needs to consider the feedback more seriously, perhaps by looking at qualitative feedback and viewing feedback holistically in the process of improving training content, structure, and course length.

In summary, the pressures from increasing policing demands and limited government funding have become the strongest drivers for Police Academy A to provide more focused and efficient policing services by concentrating on core policing services and encouraging community partnerships in preventing public security problems. In addition, Police Academy A wanted to deliver more training in soft skills and has started initiating PBL required for community policing in its curriculum. Like other police organizations in Australia, Police Academy A needs to improve its recruitment and training practices to be more consistent with the type of community policing practices.

6.2.3   Development of technology

The advancement of technology has affected many aspects of policing activities in terms of crime trends and individual work behavior (Batts, Smoot, & Scrivner, 2012). Technologies

commonly used in policing can include wiretapping, GPS/position tracking devices, fingerprint technology, databases, DNA research, camera surveillance, data mining, and network analyses (Custers, 2012). These technologies can offer vital aid in reducing and preventing crime. For example, State A Police adopt surveillance cameras (CCTVs) more broadly:

> *We've got a project called Blue Iris and we've got a link into all CCTV in the state – it can be done. All the local governments have CCTV, service stations, just through the internet we can say we want to access it or send things in.* (Senior Manager)

Based on the 2014-15 State Budget, the State A government allocated AUD1.3 million for extra CCTV networks. However, the massive amount of data collected from the CCTV networks creates significant challenges in data processing. The State A Police find it difficult to derive information from the existing extensive data:

> *Thinking about technology for us - is the volume of data. How do we data mine all this information out there? There's so much information and we don't have the best technology designed yet to actually scroll through the raw data and mine from it what we actually want for different things. So they're the major challenges for our organization in the future.* (Senior Manager)

Data mining becomes increasingly important in police work (Custers, 2012). The State A Police are cooperating with industry and universities to deal with its data mining problems. In addition, police organizations are moving towards centralized IT systems and infrastructure to enable information sharing and integrated policing (Sanders & Henderson, 2013). Centralized IT systems enable the delivery of effective and timely information to the frontline officers so that they can provide an effective mobile police service and respond quickly to incidents. According to the 2014-15 State A Budget, the state government invested AUD25.4 million in Computer Aided Dispatch (CAD) systems upgrades for responding to crime and emergency calls.

Technological and social change have thus impacted the way police interact with the community (D. Wilson, 2009) and this is reflected in the operations of State A Police. The use of smart phones and social media is becoming more common for police officers in the police agency in communicating with the community:

> *We've got frontline police officers using smart phones and Facebook and Twitter accounts so that members of the public often want to share information with police but they don't want phone calls or police knocking on their front door.* (Senior Manager)

While there have been significant investments in Information and Communication Technology (ICT) in police organizations, training and education courses in ICT for police officers remain insufficient (Hughes & Jackson, 2007). Similarly, according to the 2012 State A Auditor General's Report, recruits in Police Academy A indicated that they required more training in police IT systems, such as the in-car systems (TADIS). Therefore, the advancement of

technology has encouraged the State A Police to pursue technological-based innovation and in turn Police Academy A is required to deliver the requisite training courses for the adoption of new technology:

> *In terms of if something technological-wise occurs out in the street and we have a change in a process, then we just come back here and go "We need to start training our recruits for that." Or if it's for our own service personnel we'll put something on our Blackboard system, which is our e-learning environment, and we get that out to the organisation that way.* (Manager 3)

Koper et al. (2014) argue that proper levels of training are necessary to ensure the successful implementation of the new technology especially for technological changes involving highly sophisticated technology.

Police Academy A has adopted technological-based innovation in its training courses, such as immersive learning and an interactive tactical training simulator to improve its training and education delivery:

> *In some circumstances we're very innovative, like if you look at the other jurisdictions where one of three jurisdictions that has that new Hydra model that I was telling you about, the immersive learning, if you look at other jurisdictions we're probably one of about four that use the interactive tactical training simulator.* (Manager 3)

Having been immersed in a realistic environment, recruits can experience the decision-making process and understand the complex issues facing the police in real-life incidents. In addition, Police Academy A has adopted more technological-based innovation to improve its education and training courses:

> *There has been, I think, a very good progression towards introducing more technology into the classroom, into the training and education framework, and also into frontline policing. We're moving that more towards the virtual classroom or blended learning so there's some online learning using Blackboard, podcasts, we've got an electronic online magazine which is sent to everyone, we do broadcasts and we also have now internally, on the intranet, a portal or webpage which has all our training available to everyone in the organization. You don't have to come to the Police Academy, you can access it online. We're using tablets in the classroom which, up until eighteen months ago, we didn't have things like that.* (Senior Manager)

The first adoption of online learning technology could be associated with exploration. However, the improvements of Police Academy A's existing online learning intended to augment and refine the existing business processes in training delivery could be associated with process innovation. This is an example of temporal ambidexterity in which a short period of exploration of new technology is followed by a longer period of exploitation of existing technology.

In conclusion, technological change has had a profound effect on crime fighting and serving the community and this development of technology has encouraged Police Academy A to explore new technology that could be used to leverage their business processes or policing tasks. The

Academy had to be able to provide the requisite training courses for recruits and constables to enable them to operate the new technology and use them strategically to address policing problems.

6.2.4 Suppliers and strategic partners

Given the limited capacity and resources for developing their own innovations (Custers, 2012), police agencies need to collaborate with external partners to adopt technological-based innovation and administrative-based innovation. The State A Police has a strategic plan that mandates the development of effective partnerships and collaboration with both private and government organizations to enable it to deliver quality policing services. Police Academy A has been continuously seeking mutual partnerships with universities and industries in accessing new technologies and new knowledge:

> *We need to get more proactive and be working with industry and universities. Because we're focused on policing, we need to be having greater assistance in exploiting technology. If we start expanding our R&D areas at the expense of frontline policing services, it's not palatable to the government. Even though there's a cost benefit long term, we've got to find a balance.* (Senior Manager)

In this way, the academy strived to achieve the balance between exploration and exploitation by cooperating with selected external strategic partners. Because academy members are mostly better educated in the policing areas and not necessarily in the area of technology, the academy has relied on external partners to help them with the exploration of new technologies. Gupta et al. (2006) argue that this strategy can be effective because the exploitation-oriented organization (e.g. the academy) gets a constant supply of exploratory new insights or ideas available from selected partners.

Police Academy A developed mutually beneficial collaboration with two major tertiary institutions in the neighborhood. This alliance has facilitated and fostered a learning environment in which Police Academy A can share facilities with these tertiary institutions and exchange knowledge for continuous academic course improvements, potentially leading to exploitative innovation. The Academy has been collaborating with one of the universities in the state in tailoring bespoke courses for police officers:

> *The area that I run does some basic leadership and management and as far as academic pathways, we don't actually provide training. What we do is we tap into higher education institutions that provide training, so what we do is we liaise with the individual work area, so computer crime for example, and then look at where they're currently sourcing their higher education to identify whether that's relevant or not… Let's see what we can do by liaising with the higher education provider to try and tailor the units that are offered to what we need.* (Manager 1)

This suggests that "police need to become smart customers of education services" by negotiating learning outcomes of their externally provided courses rather than just accepting

what universities offer (Cox, 2011, p. 19). To be a smart education customer however, Police Academy A needs to gather information from frontline officers to better understand particular roles and competency shortages in the entire police agency. Police Academy A also cooperated with a university partner in particular areas of research, leading to exploratory innovation, for example in developing proficiency standards and training programs that could sufficiently prepare recruits to perform use-of-force effectively. However, the collaboration can be enhanced to involve formal long-term projects:

> *I believe the different universities should be working with us, sitting together, co-locating some of the resource stuff, ongoing for eternity, and people doing postgraduate qualifications and research, it should be full-term projects to complement what we're trying to achieve.* (Senior Manager)

Institutionalized partnerships between police and universities can offer significant mutual benefits for both parties as evidenced in the "Nexus policing project" in Victoria (Wood & Bradley, 2009).

Police Academy A also worked with one of TAFEs (Technical and Further Education) to provide alternative pathways for prospective recruits who could not enter the academy directly:

> *There's a great proportion of our society that is losing language literacy and numeracy skills, so I think a challenge for our organization in the future is to ensure that we are recruiting appropriately, putting the gateways in place to make sure that the people that are entering the organization have the right literacy, language, numeracy skills to be able to undertake their job. But also to perhaps have some sort of support or some fallback in place, that we don't lose a potentially good applicant to be a police officer based on the fact that their language literacy and numeracy skills aren't up to scratch. There should be some sort of, if you can't make it here, go back to here and you need to do some more study and that sort of thing.* (Manager 3)

While this pathway program has been available for some time, effort is needed to improve it by enhancing communication between Police Academy A and its TAFE partner in improving the selection processes of recruits for such alternative pathways.

State A Police also collaborated with several industry partners and consultants to deliver administrative innovation. It undertook the reform program in 2013 to make extensive changes to its structure and service delivery (see Section 6.2.2). Unlike the previous reform that was demanded by a Royal Commission due to corruption disclosures and inquiries, the current reform was initiated internally but mostly as a top-down process within the State A Police involving external partners to implement it. Significant budgets were allocated for contracted services from external consultants to assist the restructuring process.

In summary, Police Academy A had to collaborate with several strategic partners to enable it to pursue innovation, involving not only the use of new technology, but also the search for new

training content or structure and the refinement of existing training materials or processes to improve its training and education delivery.

6.2.5 Government or regulatory environment

Firth and Melor (1999) argue that regulations affect innovation by changing organizations' contexts and this is also true of police agencies. Legislative changes can influence the scope and the delivery of policing services. Based on the State A Police annual report 2013, the Criminal Law Amendment (Out-of-Control Gatherings) Act 2012 and the changes to the Community Protection (Offender Reporting) Act 2004 have enabled police to deliver more focused and effective services. However, amendments to the Evidence Act 1996, Criminal Investigation Act 2006, Criminal Procedure Act 2004, and other legislation for improving transparency and accountability have increased the length of time required for police to complete investigations. The State A Police is required to collaborate with the state government to establish legislation that can balance police discretion and accountability requirements in order to progress legislation through Parliament to enactment.

State policing is sensitive to government policy because it requires government funding (Findlay, 2004). The annual state budget determines the resource allocation for policing activities. The State A Police needs to meet the Police Key Performance Indicators set by the Department of Treasury. As an integral part of the state police, Police Academy A is required to focus on achieving outcomes in key service delivery areas:

> *We're paid, as all government now, by output-based management - the government says "We want these services. That's all we're going to pay you for. Deliver these services". So if it's a "nice-to-have" or something that someone wants to do but it isn't really linked to our focus, we don't do it.* (Senior Manager)

In this respect, Police Academy A needs to provide the necessary training for police officers to deliver services required by the state government (see Section 6.2.2). To ensure that the police carry out their responsibilities, the state government regulates the establishment of an oversight agency that monitors police accountability (Ross, 2007). A specialist oversight agency was established in 2004 as a major recommendation of the commission of inquiry conducted into police corruption in the state. The inquiry from the government oversight agencies can provide inputs for Police Academy A to improve the training and education process and in turn lead to innovation. The oversight agency in State A has three major functions that include prevention and education, misconduct, and organized crime. The prevention-and-education function works proactively to improve integrity and to minimize misconduct. This involves the investigation of appropriate practice and training in Police Academy A that may contribute to incidents or misconduct offences:

If there's an accident or a complaint made about the police, it'll be reviewed by the oversight body. Worst case scenario, there can be a public inquiry or royal commission, and whenever something's gone wrong the first thing people ask is "What was the training? What training did this police officer receive?" And we need to be able to show what the training was, if there'd been changes, why there'd been changes and how it was an improvement, as opposed to if it was just a cost-cutting measure. (Senior Manager)

Police Academy A was audited by Office of Auditor General in 2012. The audit resulted in a number of recommendations to improve the process of recruitment and training of new recruits in the Academy (these will be discussed in later sections). While Police Academy A has been striving to implement the recommendations, further improvements through innovation (like PBL training methods) are still needed, but they require resources.

Okabe (2014) also found that in America, the local governments could pressure police to adopt innovation but could also impede innovation by making unfair demands and limiting police managers' discretion. While there is no concrete evidence of this in the case findings, an example of how local governments in State A can impede innovation in policing is if they take up their citizens' call for additional policing resources (e.g. if a police station is to be closed in one suburb in order to consolidate resources in local policing and divert resources elsewhere, residents of that suburb could lobby their local government to intervene and exert pressure to keep the station open). In addition, Rothwell (1980) argues that compliance and reporting requirements could undermine innovation because this often took a lot of organizations' resources that could be allocated for innovation. Police Academy A is not immune to these influences and faces a balancing act between trying to be innovative and meeting compliance requirements.

In conclusion, the state government or regulations have influenced the pursuit of innovation in Police Academy A, especially through government funding. The state's oversight in particular services has encouraged the creation of new services but also conversely can also discourage new initiatives that are not listed in the state's prioritized services. The State Government was also responsible for the resource allocation of ICT investments to provide more effective and efficient policing services (see Section 6.2.3).

6.3 Four I framework

In the next section, using the 4I framework, the researcher examines how leaders of Police Academy A adjusted the internal context in response to its external context in determining organizational learning for innovation. The internal context of Police Academy A has been examined according to the constructs conceptualized in the literature review i.e. strategy, structure, organizational culture, and organizational resources.

6.3.1 Intuiting

In the phase of intuiting where ideas are generated and shared, leaders had significant influence in facilitating organizational learning for innovation in Police Academy A. This is confirmed by the following comment:

> *So again, I think it comes down to the personality of the manager, that if you've got someone who embraces innovation and creativity, then you'll have a good run. If you've got someone who just wants to keep doing things the way they've always been done, you're stuffed.* (Manager 2)

In the State A Police, the Police Commissioner was identified as the source of entrepreneurial intuition (new knowledge with future orientation) because he initiated the extensive reform in 2013 to provide high-quality policing service with limited resources to a growing population (see Section 6.2.2):

> *The whole reform process has been the commissioner who's driven the innovation. He was the one who said he wanted the reform process to happen, so it's been driven from the top down.* (Manager 1)

The Police Commissioner was appointed in 2004 and was given the special additional task of implementing the previous reform of the Royal Commission to improve police accountability. In a study of American police, Okabe (2014) argues that police chiefs' openness to outside evaluation often generates new ideas for policing. The Police Commissioner has been involved in organizational changes that include cultural, business and process changes in the agency since he was appointed to this position. In addition, he has been with the State A Police for more than 40 years as a police officer and this experience gave him a better understanding of organizational situations within this agency which was required for leading the new reform.

This reform was the State A Police's highest priority project. Senior leaders used the four key principles of the new reform to guide the reform processes by setting a sense of purpose and direction for the agency in pursuing innovation. The four key principles of the new reform program included locally-focused policing, greater control over policing activities, elevated focus on demand-reduction, and being leaner across the police agency. The State A Police has strived to move from a traditional response-based organization to a more community-focused one. Zhao et al. (2010) argue that community policing requires substantial structural changes involving the decentralization of control and reduction in administrative staff, the increasing number of civilians with a variety of occupational specialties replacing sworn officers, and the reduction of vertical hierarchy. Nevertheless, in this study, the discussion is limited to highlighting the structural changes during the reform process and how these facilitated innovation in Police Academy A.

The senior leaders at State A Police established the 'reform program structure', a dedicated *structure* as an exploratory unit, headed by the Deputy Commissioner to undertake the reform program. This type of structural differentiation would ensure resource allocation for pursuing exploratory innovation (O'Reilly III & Tushman, 2011). The reform program structure consisted of several functions, such as the Service Definition and Resource Model (SDRM) and Continuous Improvement Team (CIT). Using this reform program structure, senior leaders at State A Police strived to encourage members across the agency to put forward innovative ideas to support the new reform, particularly in improving processes and efficiencies:

> *I believe efforts are being made through the reform process to encourage innovation, because there is the potential for innovation to provide economic benefits to the organization.* (Manager 1)

To achieve this, some leaders in Police Academy A have strived to stimulate their followers to think in new directions to promote more variety of ideas and in turn exploratory innovation:

> *I think one of the things you need to do is listen, be receptive to ideas, challenge the way things have been done, ask some really silly questions – Why do we do it that way? Why don't we do it this way? And probing questions, so don't accept "it's more cost effective" or an answer like that. "Well, has this ever been thought about? If we didn't do that, what would be the results? Has it been tried before?"* (Manager 1)

> *I really want people to push the boundaries, and then we come up with the most crazy ideas, and then we start to reel it back in and hopefully we'll get somewhere where it actually does look different to what we're doing today because it's an improvement.* (Senior Manager)

During the new reform, senior management was more open towards innovative initiatives and willing to take risks that could potentially improve efficiencies:

> *I tend to think that our senior leaders are not too risk averse and will take risks if the benefits seem to be there.* (Manager 1)

> *I actually get a lot of really positive encouragement and the words they use "Be courageous, make some brave decisions, experiment and we accept that we will make some mistakes." I actually think I've got a lot of support to drive some innovation, whether that be through a method change or technology, or spend more money to save some in the long run, I'm getting support in all those areas. But it's probably again because we're marketing ourselves and telling them what we want to do and what the benefits will be, so they have confidence in saying to us "Please go and do it." So it's a two-way street.* (Senior Manager)

However, part of the reform meant that the service delivery levels of the Police Academy A were reduced with a corresponding loss of resources. In response, it became necessary during this challenging period of change management, to consider how it might undertake a meaningful reform of training within its new resource allocation and become more directive in terms of what aspects of reform were critical and achievable. This could have resulted in some of the changes being viewed as curtailing individual innovation:

There's a scale, sometimes it's not acknowledged, you're directed, this is what you're told to do, I mean we are a semi-military style organization. (Manager 1)

Police as paramilitary organizations often struggle to pursue bottom-up learning, such as gathering information from frontline officers (Geller & Swanger, 1995; Okabe, 2014) more so than other types of organizations. For example, police innovation in America tends to lack of input from rank and file members so that its implementation is often difficult (Okabe, 2014). In addition, Bayley (2008) argues that senior leaders need to involve lower-ranking officers in the development of strategic and training programs since they have rich and valuable knowledge about daily policing activities. Middle managers could encourage inputs from rank and file members in the intuiting process by channeling potential ideas to senior management and this is no different in Police Academy A as evidenced from the responses below:

I suppose through my role, my support would be perhaps as a sounding board and someone who's experienced within the organization to say whether this is going to work or not, and also at my level to say whether there may be something that the person's not aware of. As I spoke about before, a constable who comes to me with an idea may not be aware that the government's about to pull our funding. (Manager 4)

An idea can come from anywhere. It can come from the most junior officer in the organization, but unless it has support from middle management, it's never going to get past that ground level. (Manager 4)

One of the biggest barriers I see to innovation in our organization is innovation requires idea champions who will take through a good idea to a level where some research can get done and it can gain some traction and move forward. (Manager 1)

In addition, leaders of Police Academy A needed to minimize bureaucracy as Rao and Weintraub (2013) argue that to some extent bureaucracy can discourage people from putting their ideas forward and in turn impede innovation. At the academy, innovation initiatives initiated from frontline members often had to go through a bureaucratic process before it could be implemented:

[If] it's driven from a lower level in the organization, the decisions are made probably quite bureaucratically. They have to go through quite a process to get to some sort of endorsement, that kind of thing. (Manager 3)

As parts of the efforts to reduce red tape and bureaucracy in the innovation process, senior leaders in the State A Police used the help of external partners (see Section 6.2.4) to introduce some administrative changes. One of the initiatives in the reform process that used the help of external partners was the development of the Frontline Innovation Portal using "IdeaScale". The portal is a cloud-based innovation software platform that allows organizations to collect ideas from their members and gives users a chance to vote potential ideas into the top list. In Police Academy A, all police officers and staff are required to log in with their work email address to access the Frontline Innovation Portal and put their ideas forward:

> *We have an online portal, news and IdeaScale, so you can go in there and put in what your new ideas are, and every one of those ideas, the new ones, get sent off to respective areas of police to make comment on "Are we considering these things?".* (Senior Manager)

The portal thus facilitates innovation by fast tracking new ideas (even bottom-up ones) to the relevant areas without going through the hierarchy. Idea submission can be identified to encourage transparency and originators of potential ideas may receive small incentives, such as movie tickets. The Continuous Improvement Team (CIT) is responsible to promote the use of the Frontline Innovation Portal in State A Police, filter potential ideas, route the most promising ideas to the relevant areas within the organization to be assessed in terms of costs and value, and finally support the implementation of the most feasible ideas. The portal successfully attracted members to participate with around 60 percent of the workforce giving ideas, comments, or votes. This was partly because the CIT accelerated the innovation process of a few feasible, easy-win ideas and communicated the success stories to members. The state police agency has achieved significant savings in money and human resources resulting from initiatives collected through the Frontline Innovation Portal. In addition, the Portal has reduced some hierarchical barriers and shortened bureaucracy in suggesting ideas in the State A Police, including in Police Academy A. In the Academy, most changes were aimed at making the processes of training and education more efficient.

Nevertheless, in some instances, the Continuous Improvement Team (CIT) responsible for managing the portal was unable to see the potential of the ideas and therefore failed to channel the ideas from Police Academy A's members to the relevant areas:

> *I put forward an idea on the blog, it ended up in a work area that is quite busy and they basically went "it was too hard to research the idea and to look at its feasibility". And the area was specialized and also [they] didn't see that it had maybe implications for other areas of the organization, so it went to a relatively low level person who didn't have the time to look at the potential for innovation and basically the idea just fell away.* (Manager 1)

Thus, unless potential ideas are followed up and given serious consideration for implementation, the use of the Frontline Innovation Portal will not be able to complement the hierarchical channel in terms of sources of ideas for innovation.

In addition, structural changes in the IT department in the state police were undertaken to eliminate bottlenecks that impeded feed forward or the development of intuition from bottom-up. The Chief Information Officer (CIO) restructured the IT department by flattening the hierarchy and empowering functional heads to make decisions and be more accountable. With a more decentralized decision-making process within the IT department, IT leaders could be more responsive to bottom-up initiatives related to technological changes. The IT department strived to identify and minimize the misalignment between existing technologies and evolving demands

and future opportunities. However, single lines of accountability for strategy and architecture, projects, infrastructure operations, application operations, and information security were introduced to ensure system integration. This structural change was expected to encourage the generation of technological-based innovation required to achieve the organization's goals. Hughes and Jackson (2007) argue that IT strategy should support business strategy in police organizations and IT investments should be made on the premise of achieving the State A Police's objectives.

In terms of the intuiting process, through a mission and *strategic* priorities, police executives provided a sense of purpose to inspire organizational members to develop new innovative ideas. The mission of the state police is:

> "To enhance the quality of life and well-being of all people in [State A] by contributing to making our State a safe and secure place."

The State A Police's strategic plan provides a sense of direction for creating a modern, flexible, and ethical policing agency that is responsive to the needs of the state community. This strategic plan has five interrelated strategic priorities:

1. People - having the right people in the right place and in the right time;
2. Resources - acquiring the appropriate technology and resources to support the frontline officers and service delivery;
3. Standards - introducing improved standards to provide better policing services;
4. Community engagement - building good relationships with the community;
5. Partnerships - developing strategic partnerships and collaboration with government and non-government organizations.

The elements of the above strategic plan, such as community engagement and partnerships, were built on community-policing principles.

Strategic direction in an organization could inspire more variety of innovative ideas from the organization's members by providing a difficult-yet-attainable objective (Hunter & Cushenbery, 2011). The higher order strategic plan at the state police level was translated into informing strategies and annual policing priorities that guided policing activities. Police Academy A was required to synergize its initiatives with the relevant State A Police's strategies, such as formulating the workforce plan in terms of recruitments and professional development by incorporating intuitive ideas from frontline officers. Ness (1991) proposes that a police academy needs to be able to train recruits to do some entry-level police tasks. This could involve the incorporation of community policing principles in the curriculum as demanded by the reform (also see Section 6.2.2). In this respect, leaders in Police Academy A have strived to encourage their staff to pursue innovation to meet the needs of preparing recruits to be ready in undertaking their policing jobs in the field:

My thinking is that whatever we do and whatever I do in my role, it has to be linked back to what the officers are doing on the frontline. If what I'm doing day-to-day has no impact or is not benefitting the police officer that's driving around in a van, I need to question what I'm doing. That's what I always tell my staff. (Manager 4)

As the community changes, the police practice needs to change too. In Police Academy A, this has called for flexible and relevant training programs that can deliver the required changes, as confirmed below:

So anticipating what are the new challenges and emergent trends in other jurisdictions and then make sure that our training is robust enough or has enough rigor around it, that it will prepare police officers and auxiliary officers and cadets for the new challenges that they could be confronted with, which we won't always be able to train them for. So we need to make sure that they're able to anticipate the issues. (Senior Manager)

Police Academy A needs to collaborate with other areas within the State A Police to identify the gaps between the training in the Academy and the real policing tasks (see Section 6.2.2).

However, collaboration in regards to training and education across the State A Police was limited:

Within the academy, we meet together regularly about training and education. But there's not one group that meets regularly to talk about what's happening across the organization around training and education. (Manager 3)

According to the 2012 State A Auditor General's Report, there was lack of communication between Police Academy A and police stations about recruits' performance. It was further stated in the report that the documentation of recruits and probationary constables' performance and behavior needed to be improved to enable Police Academy A to use this information in the development of strategy related to training content and delivery. In addition, Police Academy A had not used feedback from recruits effectively to identify trends and areas of improvements (see Section 6.2.2). As a result, the valuable information from frontline members regarding daily problems in training content and delivery that is specific to the jurisdiction being studied had not been accommodated appropriately in the process of strategy development in Police Academy A. The lack of knowledge-sharing between organization members from Police Academy A and other units within the state police could hinder the development of an innovation strategy in Police Academy A. In the intuiting phase, leaders need to encourage bottom-up or feed-forward learning to enable Police Academy A to gather information required for developing training strategies from frontline officers. Bayley (2008) argues that police organizations need to involve frontline officers in shaping strategic and training programs to increase the acceptance of its implementation. Thus, although platforms like the Frontline Innovation Portal were available, more direct involvement of the frontline staff was required in the feed-forward process in formulating training strategies.

In the intuiting phase of 4I organizational learning, leaders in Police Academy A have to build an *organizational culture* or climate that is conducive to generating ideas. Leaders have strived to provide support to facilitate a knowledge sharing culture within Police Academy A. Nevertheless, Hughes and Jackson (2007) argue that the command and control management style commonly found in militaristic structures has impeded knowledge sharing in police organizations. In the State A Police, this management style has resulted in more top-down or feedback learning than bottom-up or feed forward learning. Seba et al. (2012) propose that leaders should provide opportunities for their followers to express their ideas which in turn promote knowledge sharing within police organizations. Many varying levels of support could be found within the organization, some leaders in the State A Police in their earlier career stages seemed to be more supportive of knowledge sharing and innovation rather than those in the final stages of their career:

> *A lot of the receptiveness to innovation is dependent on that cyclical process and I guess where that person is in their career. If they're an ambitious person that's come in to head up the organization and actively looking at making changes, innovation will have some traction. If they see this as their final posting prior to retirement or if they see it as a punitive posting, as somewhere they're being sent to as a punishment, then they're not open to innovation.* (Manager 1)

To promote more knowledge sharing and innovation in the organization, the State A Police offers recognition for police officers and staff who produce innovative ideas. For example, as mentioned above, police officers could get movie tickets for their innovative ideas submitted to the Frontline Innovation Portal. The senior management of Police Academy A also provided recognition for innovative contributions:

> *So every time one of my staff, and there's been lots of them who've come up with new ideas and things that have been accepted, I always make sure that emails have been sent out through to the commissioner, acknowledging who's idea it was, what they did. And at all staff meetings people get presented with certificates for their innovation and new ideas, so we celebrate it and never mock someone for some crazy idea.* (Senior Manager)

However, in this study there was no strong evidence to support the idea that the recognition had encouraged knowledge sharing and innovation in Police Academy A. The remaining interviewees did not mention that rewards or recognition had motivated people in Police Academy A to innovate.

The knowledge sharing culture or climate in Police Academy A was relatively more conducive to facilitate the intuiting process in some areas that in others within the State A Police. Police officers in Police Academy A tended to be more open and share knowledge since knowledge sharing in this area offered opportunities for collaborative problem solving:

> *I think it just depends on which area – I've worked in areas that are so protective, you can't get anything out of them, whereas others like the area I'm currently in that says "look, we've got nothing to hide. The more people who can help solve an issue or discover a new program, the better."* (Manager 2)

However, overall, the paramilitary structure and the "command and control" culture in the State A Police that has impeded knowledge sharing in the past is difficult to be overcome in the short term, thus hindering the intuiting process. In addition, although it was not mentioned explicitly by interviewees in Police Academy A, Seba et al. (2012) argue that time allocation is required for enhancing knowledge sharing in police organizations because police officers tend to have high workloads. The requirements of performance reporting in Australian police have increased, providing less time allocated for knowledge sharing (Hughes & Jackson, 2007) and thus may affect the knowledge sharing culture in the State A Police.

In addition to the knowledge sharing culture, *organizational resources* have limited the range of innovation that could be pursued by Police Academy A in the intuiting process. As a public organization, Police Academy A relied on the finite state budget to fund its innovation projects:

> *I think because we're a government organization we're restricted by finances. Money issues tend to suffocate innovation.* (Manager 3)

However, Cunha et al. (2014) argue that resource scarcity can stimulate the necessity of innovation to sustain the existence of organizations. With the reduction in government funding and the evolving and growing policing demands, Police Academy A was required to deliver training and professional development programs efficiently that could prepare constables for entry level policing tasks. The 2013 reform undertaken by State A Police was an effort to re-engineer its business processes to enable it to provide policing services more efficiently:

> *I think the whole reason for the current reform process has been cost driven, that the state economy has tanked, and all departments are being told to tighten their budgets, and I think that has been the major driver for this.* (Manager 2)

According to Cunha et al. (2014), under financial constraints organizations need to innovate using the available resources at hand i.e. to 'bricolage'. This has also happened in Police Academy A:

> *If we come up with an idea about how to do something better, it has to be funded with whatever resources we have available. It's got to cost very little or nothing and it's got to cost very little in manpower as well.* (Manager 4)

In addition, as previously discussed in Section 6.2.4, Police Academy A had to collaborate with external innovation partners to pursue technological-based innovation because it did not have all the required skills to deliver this type of innovation as its members were mostly better educated in the policing areas rather than in the area of technology. The police's legacy systems also often impeded their capabilities to explore new technological-based innovations:

What are the IT implications? This is a great idea but it might undermine other things that we've already got in existence. By improving this one small piece, it might impact all of existing IT infrastructure. (Senior Manager)

However, due to the resource-constrained pressures, Police Academy A had to find IT solutions that enabled it to achieve higher efficiencies. In addition, Hughes and Jackson (2007) argue that the increasing requirements for accountability and compliance push police organizations to increase IT investments and this also happened in the State A Police.

Overall, the Police Commissioner had a highly significant influence on the intuiting process by introducing the reform in 2013. The environmental context can affect the expansion or contraction of policing tasks (Millie, 2013). The State A Police undertook the reform to meet increasing demands for policing service with very limited resources. Consequently, Police Academy A had to pursue innovation to enable it to provide the necessary education and training courses for recruits very efficiently so that they would have the required skills and competencies to deliver the specified policing services. However, the pursuit of technological-based innovations at Police Academy A to improve the effectiveness and efficiencies of its education and training delivery were often impeded by the high cost and the legacy systems.

Previous studies demonstrate that most innovations and reforms in policing organizations, such as in America and Australia have been driven by people or events outside policing (i.e. Baker & Hyde, 2011; Bayley, 2008). However, a few innovations were instigated internally but nevertheless required external partners to implement them. For internally-driven innovations and reforms, they were often brought in by police executives who were open to suggestions from knowledgeable external partners. This kind of innovation process was often strongly determined from the top with less involvement of rank and file (Bayley, 2008) and in order to address this, the State A Police has strived to be more consultative and responsive to inputs from lower-ranking police in its reform process via tools like the Frontline Innovation Portal.

Next, the researcher investigates the interpreting phase of 4I organizational learning at Police Academy A.

6.3.2 Interpreting

In the interpreting phase, the role of strategic leadership was required to guide the interpretation of Police Academy A's strategic direction in the pursuit of innovation. Executive leaders used the reform principles and State A Police's strategic direction (see Section 6.3) to set the context for the interpretation of ideas and intuitive insights during the intuiting stage. In this way, these leaders adjusted the strategy, structures, organizational culture, and organizational resources to set the context for the interpretation.

The State A Police's *strategic* direction was used as a source of sense-making of the external environment where leaders in Police Academy A strived to formulate strategies to respond to external challenges and to take advantage of external opportunities:

> *We obviously have our strategic plan, we have our annual action plan or policing priorities, business units have their action plan, we have informing strategies and what it is we're trying to achieve in specific areas of policing.* (Senior Manager)

Police Academy A was significantly influenced by the state government in formulating its strategy since the state government decides on regulations, the policing budget, and key service delivery areas (see Section 6.2.5). The demand for policing services has been increasing and has become more complex but the state government has tended to reduce the budget for police. Police Academy A thus had to formulate strategies to deliver high quality education and training with limited resources. These strategies then set the context within which staff would interpret their ideas. Among these strategies were those to address the difficulties in recruiting new police officers. According to the 2014-15 State Budget, the State Government committed AUD75 million in regional incentives over the next three years to attract police officers to remote and regional communities. Police Academy A also reinstated its overseas recruitment strategy. New experienced police officers recruited from overseas need to complete a 13-week transitional training course at the Police Academy A. The Academy also launched a special advertising campaign to attract more female recruits and those from multicultural backgrounds to meet diversity targets.

Leaders at Police Academy A also considered the changes in the external environment in developing its policing strategy thereby setting the context for interpretation of ideas during the intuiting phase. The examples of external environment factors included the evolving policing service demands, technology advancement, and police stakeholders. When asked about the drivers for innovation, the following comment was made:

> *Well, it's demand for our services from the community; new crime types; new trends in policing; new innovation; new technology that hasn't been made available to us before; things being less cost prohibitive and more cost effective and accessible.* (Senior Manager)

Police Academy A also set the context for interpretation via strategy by collaborating with ANZPAA, Australia New Zealand Police Advisory Agency, which developed and shared strategic policing initiatives:

> *We're members of ANZPAA in Victoria, which all the police commissioners in Australia and New Zealand head, form the board, and then collectively we determine what are the frontline policing needs and then what is specific to the different jurisdictions. And then all of the training around that continues to evolve.* (Senior Manager)

By considering the external forces, Police Academy A strived to formulate a strategy which enabled it to provide education and training that could meet the evolving policing tasks. However, Braga and Weisburd (2007) argue that police tends to formulate incident-driven and reactive strategies and there is some evidence of this in the formulation of education and training strategies in Police Academy A. The training and education strategy in Police Academy A was often interpreted by middle managers and the lower echelon to be reactive and piecemeal:

> *I don't believe that we necessarily go out and be proactive and long term strategic about it. It's very reactive. If we hear about something else that somebody's doing, we might grab hold of it and go "Oh, let's do that" but we certainly don't spend a lot of time looking around and thinking about how we can be innovative.* (Manager 3)

To enable a police agency to articulate a vision and formulate long-term strategies for policing education, the agency needs to answer the fundamental question of "what should the office of constable be and what capabilities should it embody to conduct policing in the twenty-first century?" (Cox, 2011, p. 9). However, it is not solely the Academy's responsibility to develop a comprehensive training and education policy and long-term strategy to meet the challenging policing demands in a resource-constrained environment. This will require knowledge-sharing and collaboration among organizations members from the relevant areas across the State A Police agency.

State A Police would like to promote collaboration and knowledge sharing in order to improve its overall business processes (including the processes in Police Academy A) by undertaking significant *structural* changes through the reform in 2013. This is supported by the comment below:

> *I think the reform is encouraging collaboration and the idea that we can't solve everything on our own. We need to work together as an agency because we're all on the same side so we need to talk, we need to open up more and not be so secretive, because then better things will happen.* (Manager 2)

As discussed earlier in Section 6.3, the reform program structure included several functions, such as the Service Definition and Resource Model (SDRM) and Continuous Improvement Team (CIT). The SDRM program provided recommendations for the Commissioner's Executive Team to examine services being delivered across the state police, including at Police Academy A and to identify opportunities to deliver these services in more effective and efficient ways. The SDRM reviewed the processes of Corporate and Business Support Areas, Police Specialist and Operational Support, and Frontline Police Facilities. In each of these areas, SDRM panels would:

- conduct a structured analysis of resources, costs, and their application;

- identify and evaluate the impact of changes in demand for services, variations in service levels, and method changes where efficiency improvement would enable provision of the same level of service for a lower cost;

- and provide recommendations for the Commissioner Executive's Team to examine service and alternatives.

In this respect, SDRM panels pursued exploration to identify areas of improvements. In addition, CIT was formed to manage the Frontline Innovation Portal to enable bottom-up learning by allowing frontline officers to give ideas around process improvements (see Section 6.3). These mechanisms have encouraged reviews and the implementation of business process improvements and structural changes across the whole state police agency, promoting exploratory innovations. The SDRM enabled the development of common language about new improvement opportunities (exploration) from the lower levels of management that could be interpreted and be better understood by police executives. Dialogues and conversation with others could help an organization member who had an idea to develop words to explain what had been vague ideas to emerge into insights with finer levels of detail as suggested by Crossan et al. (1999). For example, Police Academy A identified the need for having a specific business unit responsible for curriculum development which is more consistent with community-focused policing (see Section 6.2.2):

> *I think we should have a curriculum development area, because what happens is that because we're very reactive to the numbers that come in all the time and we don't plan very well, we're very reactive all the time. Our trainers are always training, very little time to develop curriculum or review curriculum.* (Manager 3)

The idea above was shared among leaders in Police Academy A and obtained positive responses from them and then was forwarded to the police executive team to be evaluated in the integration process.

In the interpreting phase of 4I organizational learning, members from different functions in State A Police and Police Academy A often viewed the importance of knowledge differently due to different skills, knowledge, and perspectives. While an organizational culture that allows its members to have different perspectives is required to create an ambidextrous culture (C. L. Wang & Rafiq, 2014), difference perspectives could influence knowledge sharing among the members of the state police at varying levels. Hughes and Jackson (2007) argue that the divide between different groups (such as police officers-sworn vs. public servants-unsworn) might hinder the sharing of knowledge in a police organization. This also happened in the state police and it tended to lack communication and collaboration between functions:

We're very siloed in our organization. We operate in portfolios and each of those portfolios operates independently of the rest of the organization, and I think that's something with the reform process that we're trying to change. (Manager 3)

The above supports the argument of Seba et al. (2012) that the hierarchical structure in police organizations inhibits knowledge sharing because each division tends to work in silos and the "command-and-control" culture discourages learning in a bottom-up manner.

As such, leaders had to facilitate conversation or dialogues between different groups and functions (collective interpreting) through informal and formal meetings to promote a knowledge sharing *culture* or climate in State A Police, including in Police Academy A. However, police officers and staff in the State A Police tended to be reluctant to share knowledge when they thought that sharing knowledge would affect their careers negatively. Seba and Rowley (2010) propose that the strong perception of "knowledge is power" among police officers can become barriers to knowledge sharing because knowledge is often viewed as a strong differentiator in achieving career aspirations. People tended to share knowledge and in turn innovate when they perceived that knowledge sharing and innovation would have positive impacts on their careers. On the contrary, Amayah (2013) argues that people may be discouraged to share knowledge when the cost of sharing knowledge outweighs the personal benefits. For example, police officers did not want to share knowledge because the promotion system tended to overly rely on behavioral interviews concentrating on individual knowledge rather than creating and sharing within teams (Hughes & Jackson, 2007). This appeared to happen in the State A Police where some police officers in certain areas tended to hesitate to share knowledge and therefore could impede the development of innovative ideas in the intuiting and interpreting phases:

> *I think patch protection, the idea that some areas don't want to share their ideas with other areas because somebody might steal an idea and then run with it. I've noticed in the last twenty years with [the state police], there's certainly a lot of patch protection.* (Manager 2)

In addition, police officers might be discouraged to share knowledge during the reform process because they viewed knowledge as "power" to retain position within the state police agency:

> *The reform means things will change whether you like it or not, and that'll cause a great deal of fear and uncertainty in people about their jobs. It's causing fear about whether people are going to be sacked and where they're going to be moved to if their job is made redundant. I think it's causing a lot of conflict because there's a certain degree of patch protection. Areas are going "Well my area is really important and your area isn't".* (Manager 2)

Leaders in the state police have used a number of communication and consultative programs to 'socialize' the reform program to explain the need for changes and promote active participation from all organization members in the reform process. In this way, the leaders promoted a

knowledge sharing culture and collective interpreting within the agency and encouraged organization members to develop new ideas for innovation to support the reform program.

Knowledge sharing and collective interpreting in the State A Police did not happen as smoothly as expected due to other organizational cultural issues such as the lack of trust. Trust is a significant factor for knowledge sharing in police organizations (Seba, et al., 2012). The level of trust to share knowledge in some areas within the state police agency seemed to be low indicated by "patch protection" in these areas and this has inhibited knowledge sharing and collective interpreting in this agency. Leaders in the State A Police need to encourage collaborative problem-solving so that organization members could see the benefits of knowledge sharing in developing innovative solutions. In addition, to some extent, the reform might have decreased the level of trust to share knowledge because some police officers were afraid to share information that could potentially result in the disbanding of their positions:

> *They may be working in areas where they've been betrayed or there's been a lack of trust before.* (Manager 2)

Under the Service Definition and Resource Model (SDRM) program, leaders in Police Academy A communicated the available support for staff whose positions were made redundant, such as the opportunities of redeployment. In this way, leaders strived to minimize the negative impacts of reform on the levels of trust in Police Academy A so that police officers were willing to support the reform process by sharing knowledge in the process of collective interpreting.

In some instances, job rotation has had negative impacts on knowledge sharing for collective interpreting in Police Academy A and ultimately on organizational learning for innovation. Job rotation can encourage knowledge sharing by enabling organization members to develop information networks and exchange knowledge with others across various functions in the organization (Kubo, Saka, & Pam, 2001). However, the regular movement of leaders from one area to another tended to impede learning and inhibit knowledge sharing in Police Academy A. Officers would normally stay in a particular position for two or three years before they moved on to the next position. A relatively short period of time within a particular position often did not provide enough time for these leaders to develop the requisite knowledge and common understanding (or shared interpretations) that enabled knowledge sharing with other organization members in their new units. This has caused leaders in Police Academy A to be unable to comprehend the business processes in the new unit and subsequently curtail any significant changes or the pursuit of exploratory innovation:

> *So apart from some individuals, and their areas tend to be innovative, most individuals are moved regularly and not allowed to become experts in their field. It also doesn't enable people to develop a passion for a particular area. So if you have a particular*

passion for a training environment, that can't be fostered because of the way that the organization runs. You can only stay in this area for a short period of time before you're moved on. That's police officers. (Manager 1)

Brunold and Durst (2012) argue that poor knowledge documentation could lead to failure in knowledge transfer in the process of job rotation. Therefore, Police Academy A needs to have better knowledge management systems to minimize the risks of knowledge transfer failures or even knowledge loss due to job rotation. Brunold and Durst (2012) also state that job rotation can lead to a situation where the knowledge base remains at status-quo and this is evidenced in Police Academy A:

> *I think to some extent we tend to move people around fairly rapidly. New ideas come with new people moving into an area, and in some areas there's a strong resistance to change because they know whoever's trying to implement the change will move on. So if they resist it for a period of time, things will go back to the way that they have been once the new person has moved on. And it tends to be that the more ambitious managers move into an area for a shorter period of time and then move on.* (Manager 1)

In this respect, to some extent, leaders' job rotation has not been able to facilitate knowledge sharing in State A Police and Police Academy A as expected. Since the organizational knowledge bases in some areas remain at the status-quo, some areas in the State A Police and the Academy tended to pursue exploitative learning where people were more likely to exploit existing knowledge.

In the interpreting phase of 4I organizational learning where ideas are shared with members of the organization or a community of practice, *organizational resources* also influenced how members in Police Academy A perceived the opportunities for innovation because resources were considered in examining the feasibility of new initiatives. For example, new emerging IT might not be considered for adoption to improve efficiency because it was too expensive:

> *There's always a suggestion "If only we had this extra function on our computer we could save all this resources." But what we're finding now is to put an extra tab on a computer screen may cost fifty, sixty, seventy, hundred thousand dollars, so those sort of financial constraints are very real.* (Manager 4)

Due to the limited resources, Police Academy A had to pursue process improvements aimed at increasing efficiencies or cost savings. This could be associated with a cost-leadership strategy. In addition, Police Academy A strived to focus on primary policing services by empowering people from the community to participate actively in crime prevention in order to reduce policing demands (see Section 6.2.2). Although a little bit different from business organizations, the "elevated focus on demand reduction" in Police Academy A was most comparable with the differentiation strategy as it related to differentiating policing services by delivering more focused and efficient services. Santos-Vijande et al. (2012) argue that organizations can pursue strategic flexibility to respond to changing environments by having

both a cost-leadership strategy and a differentiation strategy. Therefore, Police Academy A has tried to balance cost reduction and service differentiation with the emphasis on cost efficiencies to enable it to respond to growing demands with finite resources.

In the interpreting process, different areas within State A Police could have different opinions about existing organizational resources. For instance, Police Academy A wanted to initiate online training called "Collaborate" for police officers who were in remote locations. Some people viewed this initiative positively as it offered significant cost reduction:

> *Now we're trialing Collaborate and delivering a virtual classroom to [a remote area], sixteen hundred kilometers away. Instead of flying police officers down at great expense and having to put them in a hotel for two weeks, we're actually delivering online with Collaborate*. (Senior Manager)

However, other people from different functions thought that this initiative could potentially fail because of inadequate resources:

> *And whilst the infrastructure is set up at the academy it's not in place in the distant locations or in the police stations, so in a busy police station computers are at a premium. And the computers are required to do briefs for arrests, so the likelihood of a staff member being able to sit in a quiet location and study and do online learning is practically impossible. There's not the space, there's not the computers, and they're not allocated the time*. (Manager 1)

While different views could promote more robust solutions, these differences could also threaten cohesiveness, posing a threat to the organization. Thus, this needs to be addressed in the integration process of organizational learning in Police Academy A.

In general, the executives in the State A police consistently used strategic direction and reform principles to set interpretations for its organizational learning and this was communicated across the whole organization. The process of interpreting at Police Academy A was a relatively top-down process where organizational members had to change their interpretations according to the direction from the police executives. However, the fear of losing jobs and the uncertainty related to massive structural changes during the reform has discouraged organizational members to share knowledge and support the reform process. Leaders in the State A Police have tried to minimize this problem by communicating the reasons for change and consulting the proposed changes to the relevant internal stakeholders.

Next, the researcher discusses the integrating phase of 4I organizational learning at Police Academy A.

6.3.3   Integrating

In the integration phase of 4I organizational learning, leaders provide a common purpose to integrate new and existing learning at group and organizational levels (Berson, et al., 2006).

157

Leaders at Police Academy A used the four key principles of the 2013 reform to develop a shared understanding among organization members. However, significant restructuring plans to make the organization leaner made many organization members in the state police, including in Police Academy A, uncertain and insecure about the reform:

> *We've only just received the Policing Plan and the police reports and things like that, and I think because there's still so much uncertainty. We've got the Policing Plan that says this is how we need to do things, that says we need to be leaner. Well, what does that mean?* (Manager 2)

In addition, some police officers were reluctant to embrace changes for various reasons. Changes could mean more work to be done during the transition from the old systems to the new systems:

> *Like in most organizations, what happens is that people are asked to do an additional amount of work or adopt a new way of doing things and still maintaining some of the old ways.* (Manager 1)

Some police officers also often found it difficult to accept changes because they did not know how to undertake the changes:

> *People that don't know how to do it are avoiding the change, so there's a bit of a decline in productivity or employee satisfaction, but once we start to celebrate the successes and focus on the positives, we see it come up and everyone gets on board.* (Senior Manager)

Police Academy A's leaders were required to convey the reform processes to their followers in their areas and to guide the transformation from the previous structure to the new way of working while minimizing the impact on the provision of policing services to the community. To address concerns and minimize internal and external rumors, the Service Definition and Resource Model (SDRM) panels with managers and officers in charge provided the opportunity for all team members to give feedback regarding the proposed changes. In addition, regular updates around reform were available on an SDRM Portal on the intranet page and in broadcast emails resulting in better communication and consultation:

> *This new reform is being done better because there's more communication and there's more involvement at every level. I think our organization now is adjusting well to the change that we know is coming. I think it's been more consultative.* (Manager 2)

> *This current reform process has been a lot better. There's significant lead-in time, there's a lot of consultation, a lot of communication coming down to us, so at the moment I think we're doing exceptionally well.* (Manager 4)

The reform affected organization members differently and they reacted to the reform in different ways. Some people who lost their positions found it hard to accept the reform and therefore were reluctant to participate in the reform process. In this respect, it was difficult to achieve the integration of different views:

I don't think that conflict will be resolved a hundred percent. You will never achieve harmony in a department this size. (Manager 2)

The police union's recommendations seemed to have little voice in affecting the State A Police's decisions around the reform processes. The state budget constraints were more likely to mitigate rebellious behavior among organization members in the state police, including in Police Academy A. Having recommendations from the SDRM panels, a Corporate Board reviews the proposed changes and signs off the approvals. The integration process in the State A Police was exercised through the executives' power and authority. The Corporate Board would not allow members' disagreement to affect management initiatives and final decisions:

> *I think the decisions are all being made at the high level, the command level, and while people are involved in the process to some degree, I still think the decisions are all going to be made by the top echelon. I think at the end of the day they've got an agenda, they know what they want, and they're going to implement it regardless of what people want.* (Manager 2)

The reform has brought significant administrative changes in the state police, including in some areas in Police Academy A.

In the integrating phase of 4I organizational learning, Police Academy A's leaders made *strategic* choices that were aligned with the State A Police's mission and strategic priorities:

> *And if anything we're doing, if any of this innovation isn't in support of what we're doing [strategic priorities], then we're not going down that path.* (Senior Manager)

Leaders of Police Academy A also used strategic priorities and vision to integrate different views in an attempt to create an ambidextrous culture (having diverse functional perspectives but sharing a common vision) and in turn contextual ambidexterity as suggested by Wang and Rafiq (2014). The principal of Police Academy A communicated the most promising innovation initiatives to the executives of State A Police. Having the most complete understanding of the strategic context of the state police, police executives evaluated these initiatives and would endorse them to be implemented if they had the potential to meet external challenges and achieve their objectives:

> *When we want to change something significant we do have to provide briefing notes through the chain of command right up to the CEO, so the Commissioner of Police is aware. They need to see that what we want to do isn't in conflict with their strategic path, because they've got the greater good of the whole organization and we're thinking about the Police Academy.* (Senior Manager)

In this integration process, police executives played a significant role in determining whether Police Academy A would pursue exploratory or exploitative innovation. When these top leaders could see the potential benefits of new exploratory initiatives and could provide the required resources, it would be most likely that they would approve the initiatives.

Although the leaders in State A Police were more willing to take risks (see Section 6.3.1), they only welcomed calculated risks related to new initiatives:

> *We're looking at the risk involved. What is the risk to the officers? What is the risk to our finances? What's the risk to the community? So in that sense that is very formalized. We have a whole lot of processes involved where, if it's too high risk, the project won't get off the ground to start with. It'll be cut and they'll say "It's too risky. The cost to the community is too great. Even though it's a great idea, we're just not willing to take the chance".* (Manager 4)

Leaders in Police Academy A also prioritized innovation initiatives that aimed to achieve increased efficiency due to the state budget constraints:

> *A financial implication is a big one. We're going through tight budgetary restraints, so the big saying now, instead of "doing more with less", is "how can we do less with less?" That's the big drive within the organisation, because of budgetary constraints that we're seeing from the government.* (Manager 4)

In the tight fiscal climate of the state government, the State A Police (including Police Academy A) needed to perform policing services as effectively and efficiently as possible. However, the academy also strived to adopt more community policing in its curriculum to differentiate its services from past practices.

In the integrating phase of 4I organizational learning, executive leaders at State A Police introduced a more centralized *structure* through the reform in 2013 to promote integration across the police agency and to enable resource sharing and increased efficiency:

> *This organization went through a change in the early nineteen nineties, where we went from having a lot of centralized units to being more outsourced, and now we're coming back in. So we're going through a reform process where we're looking at how we can centralize things to look at benefits, cost of scale and those sorts of things.* (Manager 4)

In the previous reform, the police agency had more decentralized units to improve accountability and organizational efficiency but in practice its implementation resulted in a 'patch mentality' and thereby impeded knowledge sharing. Such indication supports the study of Hughes and Jackson (2007) that decentralized units could potentially hinder knowledge sharing in a police organization in which increasing demands on collecting data in each district and islands of information became prevalent.

In Police Academy A, since training and education was not centralized, it was difficult to list all professional development needs and to ensure that all professional development programs within the state police had nationally recognized qualifications:

> *So everything that's done in terms of training and education out there in the organization, is different to how it's done here, so there's no structures or processes in place currently that govern the way training and education is delivered, managed,*

evaluated. It's just all done differently, according to each little business unit. I call it the [State] Police training pizza because there are bits and pieces all over it. (Manager 3)

At Police Academy A, a new centralized curriculum development unit was proposed by senior management to create and facilitate a centralized and integrated consultancy for professional development within the state police:

And at the moment we're in the process of starting up a new business area, taking people from it to relocate them into an area which will deliver ongoing training needs analysis for the needs of the frontline policing officer… we believe there will be better efficiencies bringing them together. And then how people cycle through there with subject expertise as needed, instead of just people all throwing it in but there's no-one there. It could be better. So we actually are progressing that. (Senior Manager)

In addition, cross-functional teams within the police reform program structure identified constraints, inter-independencies, and opportunities for collaboration between organizational units in the implementation of innovation. Jansen et al. (2009) argue that cross-function interfaces could facilitate the development of shared understanding among organizational members from different units. Overall, the Corporate Board with more complete understanding of the whole organization context, strived to integrate interrelated initiatives and was responsible for their approval.

While State A Police had to adopt a centralized approach to improve coordination and efficiency within the organization, different parts of the organization could require distinct structures to respond to differing environmental changes. Although community-policing often required decentralization of control (Zhao, et al., 2010), it does not mean that police organizations should fully adopt a decentralization approach. For example, the centralization of resources and personnel coupled with supporting technology could encourage more interaction among investigators and promote greater pattern recognition of serial robbery than geographically decentralized robbery investigations (McCluskey, Cancino, Tillyer, & Tillyer, 2014). Therefore, police organizations should carefully plan structural changes and consider the organization-specific implications of such plans in order to gain the most benefits (Zhao, et al., 2010). At State A Police, as previously mentioned in Section 6.4, the IT department decentralized some of its control to enable leaders at lower levels of management to make IT decisions quickly to respond to the changes in the external context. However, strategic IT decisions were still controlled by the CIO and other police executives to ensure system integration, resource sharing, and collaboration.

In addition to organizational structure, leaders at Police Academy A also strived to develop an organizational *culture* or climate that promoted the integration of learning by sharing the reform principles and the State A Police's strategic direction. The reform process was communicated and consulted throughout the whole state police agency through Service Definition and

Resource Model (SDRM) programs. Leaders in Police Academy A encouraged staff participation in the reform process through both the Frontline Innovation Portal and formal meetings. Flores et al. (2012) propose that openness and participative decision making promotes the integration of views. However, at Police Academy A, some formal meetings allowed staff to participate in the management process but other meetings only served as occasions for telling members what to do, particularly during the reform process:

> *We have lots and lots of meetings. Whether the conduct of the meeting encourages the sharing of ideas is completely another thing. I know that some meetings do and some meetings don't. They're seen as a way of "this has come from the top and I am passing it on to you" and that's the end of it. The sharing of ideas and discussion about our problems is minimized, in fact it can be discouraged through trying to have meetings as quickly as possible... and that's probably a conscious thing in that discussion of problems and sharing ideas is time consuming and sometimes counterproductive, or creates work.* (Manager 1)

While formal meetings could be a facilitator for knowledge sharing and problem solving in police organizations (Seba & Rowley, 2010), members of Police Academy A sometimes experienced these meetings as part of the "command and control" culture of the organization. In the integration process of 4I learning, senior leaders made the final decisions with lack of input from frontline officers and these decisions mostly resulted in the integration of member behaviors but did not necessarily change their thinking.

In addition, Braga and Weisburd (2007, p. 17) argue that "police most easily adopt innovations that require the least radical departures from their hierarchical paramilitary organizational structures, continue incident-driven and reactive strategies, and maintain police sovereignty over crime issues". This seemed to be the case in the State A Police which in turn affected Police Academy A, especially before the reform where it took some time to get an innovation through from the intuition stage to the institutionalization stage:

> *One of the things we try to push here at detective training school, is rather than us going out and training people all the time which has cost a fortune, or have people from regional areas come down from the country to here for training, we want to put it out on a Blackboard course, so people can go meddle into IT and read through the legislation, they have some scenarios they can answer some multiple choice questions which gives them some understanding of what the legislation is all about, and trains them a bit. And trying to do that innovation took us about two years to get that through to a stage where now it's gone through the whole organisation and everybody thinks it's a fantastic idea.* (Manager 4)

Hughes and Jackson (2007) found that a bureaucratic command and control management style in Australian police organizations tends to stifle innovation and creativity among organizational members. Again, while the collaboration among organizational members at Police Academy A was better than other areas within State A Police, because knowledge sharing in this area requires collaborative problem solving across various functional areas, it was not adequate to

promote more exploratory innovations. Knowledge-sharing and collaboration for improvements of training and education courses has in the past been hindered by insufficient communication between other functional units and Police Academy A. It has been difficult to change the traditional "command and control" culture that has prevailed over the years and it is only in recent times with the reform and the introduction of initiatives like the Frontline Innovation Portal that there has been encouragement of bottom-up learning for innovation.

In the integrating phase of 4I organizational learning where exploratory and exploitative activities and resources are rationalized to pursue innovation, leaders in Police Academy A were driven by *resource* allocation because organizational resources (particularly funding) were limited:

> *So you may send it up to the senior management and say "this is an idea" and they may just say "listen, great idea but we've got all these other priorities we need to consider before we get to your idea." So I suppose that's the main idea. It's not that innovation is stifled, it's just because we have so many competing priorities on us at the moment.* (Manager 4)

Crossan and Bedrow (2003) state that the integration process is difficult to achieve when it involves a trade-off in resource allocation. Leaders in Police Academy A strived to achieve a strategic fit between innovation choices and the external environment, especially the requirements and regulations of the State A government. Leaders in Police Academy A used mission and strategy to guide the prioritization of resource allocation for innovation and for police executives to make final decisions on significant changes:

> *At the executive level of the organization, the commissioner, the two deputy commissioners, executive director and some other key stakeholders, they will determine a bit of a cost benefit analysis and they'll have the ultimate say.* (Senior Manager)

In this way, police executives with the most complete understanding of the strategic context integrated resource allocation for both exploration and exploitation across the whole State A Police agency.

With the strong resource-constrained pressures, Police Academy A was forced to adopt advanced technology (e.g. better online learning) to gain increased efficiencies. In addition, Evans (1990) argues that in a resource constrained environment, the introduction of distance learning is inevitable for police training in a large and widespread jurisdiction to ensure that police officers have up-to-date skills and knowledge (such as all procedures, legal matters, and policies) to carry out policing tasks. He further proposes that the establishment of a regionally based training officer network is required to ensure that the appropriate technology is installed in regional office networks to ensure they have the capability to conduct online learning and this is something that Police Academy A needs to consider for its regional offices. A respondent in this study identified that a police station in a remote area might not have adequate resources to

conduct online learning in terms of computers and spaces (see Section 6.4). While it may be difficult for the State A Police agency to install the required infrastructure in every police station due to financial constraints, the agency can establish a regionally based training officer network in some distant areas. This will enable Police Academy A to provide training and education courses in both centralized and decentralized bases. This can include training that requires face-to-face meetings. For example, driver training will remain on a centralized basis since the specialized facility is located in the training center and it will be very costly to build the facilities in a decentralized basis. However, weapons training can be conducted on both centralized and decentralized bases. The weapons training for recruits is conducted at Police Academy A but refresher training can be carried out in the region as the Academy has a portable interactive tactical training simulator which uses a computer to generate life-like scenarios that allow officers to hone their weaponry skills.

In the integrating phase, Police Academy A often faced tensions in adopting new technological-based innovations as evidenced by the example below:

> *It's older, but to introduce a whole new operating model for our IT or for our case management, it means retraining six thousand police, it costs tens of millions of dollars, and then there's ongoing costs, trying to transition over – that's the tensions.* (Senior Manager)

In addition, the adoption of new technological-based innovation could be impeded because frontline officers may feel that the reporting requirements through the IT systems put more burden on them (Koper, et al., 2014) and this appeared to be the case in Police Academy A:

> *From when I joined the organization and typing out matters on a typewriter, to now we've got computers and you'd think it would make our work a lot less, but it seems to have made it more cumbersome, there's more forms to fill out on a computer.* (Manager 4)

As such, the State A Police IT department had to facilitate communication between units to facilitate knowledge sharing and integration of different views related to resources in the adoption of new technological-based innovation.

Overall, Police Academy A had a relatively high level of integration of behaviors despite disjunctive beliefs and this had allowed the implementation of radical changes, such as the establishment of the centralized curriculum development unit. However, the state of learning at Police Academy A was more fragile than it appeared since the integration of behaviors did not necessarily indicate the integration of thinking. Police executives exercised strong leadership and a centralization approach in achieving integration of different views within the organization. Leaders in State A Police had to be more proactive in communicating the progress of the reform process and consulting with the relevant internal stakeholders to enable successful implementation of the proposed changes.

In the following section, the researcher discusses the institutionalizing phase of 4I organizational learning at Police Academy A.

6.3.4   Institutionalizing

In the institutionalizing phase of 4I organizational learning, leaders in Police Academy A embedded new knowledge into the systems, structures, strategy, routines, and infrastructures. These leaders provided clear guidance on how the reform process would be undertaken which was outlined in the SDRM program toolkit. The reform process was formalized to ensure efficient implementation:

> *I think that's [formalization] been necessary in order to have achieved standardization across the board. You need the process to be the same, so every person in every area was subjected to the same process and I don't know how you can do that without a lot of paperwork. So again, I accept that that's just part of the process. Others have struggled with that, but I don't know how it could have been done better. There's been a lot of meetings and there's been a lot of material to prepare for each stage.* (Manager 2)

Darroch and Mazerolle (2013) argue that a high degree of formalization can impede police innovation. This can be true in the sense that formalization does not provide enough freedom for police members to find novel solutions. However, while a higher level of flexibility is needed in the initiation phase of innovation to enable exploration of ideas, a higher level of formalization is required in a later stage of the innovation process to facilitate the transformation of a vague idea into a specific project (Mattes, 2014). In the implementation phase of the reform in Police Academy A, decisions were made and implemented in a top-down manner promoting top-down or feedback learning. Management required formal documentation and applied clear rules in communication that followed a hierarchical channel. When the Corporate Board approved the implementation of major changes, formal notification of change would be provided to all impacted police staff advising them that their area would be changed. Leaders provided regular communication and encouraged open dialogues with staff regarding the reform process to explain the context of the proposed changes for their business unit and outline the available support for staff to face the changing or disbanding of their positions in the future structure:

> *I think as long as you support them through the change process, then that helps people to cope with that a bit more. Making people still feel worthwhile and that they're making a contribution to the agency I think is really important.* (Manager 2)

Representatives from the Human Resource Reform Implementation Team (HRRIT) provided support and assisted in the redeployment process for impacted police staff in Police Academy A. In this respect, leaders tended to use a high degree of formalization during the implementation of the reform in Police Academy A.

In addition, the leaders tended to use the 'pilot project' method to implement significant changes and projects were replicated more broadly across the entire organization when the pilot projects were successful:

> *There's a lot of modeling done, a lot of pilots. We've got fourteen police districts in this state, we often use one or two districts to pilot new technology, new innovation as a bit of an experiment and say "Okay, aspects of it were really good, and there were aspects that didn't work. Let's celebrate what worked, focus on what didn't work", and then we'll come up with "Okay, now we're going to roll it out more broadly with the new improved version which works".* (Senior Manager)

Boscherini et al. (2010) argue that the use of pilot projects can reduce the potential resistance regarding the approval process within the organization because of its relatively small scale budget requests. Police Academy A used pilot projects to minimize the cost and risks associated with the implementation of new services.

In the institutionalizing phase of 4I organizational learning, leaders in Police Academy A made decisions around resource allocation, structure, and inter-business relationships to implement *strategy* across the organization. Police Academy A tended to pursue top-down or feedback learning in this stage. Strategy was generally cascaded through management and implemented as part of performance objectives. However, some strategies were implemented as projects:

> *It'll be a project, it might be a small project or medium or large scale, and there'll be different stakeholders brought in. There'll be a champion at a high level who'll be tasked with overseeing the project so it gets some weight behind it.* (Senior Manager)

Like other police organizations in Australia, Police Academy A tended to adopt the community policing philosophy in its strategy but given resource constraints, allocated minimal resources to institutionalize community policing as a dominant paradigm. This gives credence to the findings of Fleming and O'Reilly (2007) who argue that the primary inhibitors for full implementation of community policing included the strong elements of the authoritarian and hierarchical governing structures, strict organizational rules and legislation, an emphasis on performance management in a highly politicized environment, and community expectations for more conventional policing services. These are some of the characteristics that Police Academy A has faced in the past and although there are moves towards overcoming them, it will take time to do so.

In Police Academy A, some training strategies appeared to lack proper planning and inclusion of inputs from frontline police officers in the development of training and education, creating problems in implementation. For example, the size and comprehensiveness of training and education packages were not thoroughly considered:

> *Often in the academic learning environment it simply will be "now we want you to include this in the curriculum" or mental health is the topic of the moment. "Now, I*

166

want you to include development of people's skills in dealing with those with mental illness." But rather than take off some other part that's seen as less important to make room for it, it's added onto the top of things. (Manager 1)

As a result, some recruits felt that they needed more training in particular areas but Police Academy A was unable to accommodate this (see Section 6.2.2). Therefore, Hoeckel et al. (2008) argue that training packages in vocational education and training in Australia need to be updated and simplified to improve flexibility to meet fast changing skills requirements. In addition, training needs to be able to prepare recruits to be self-directed learners (Cox, 2011). In this way, the problem in the implementation could trigger exploration of new knowledge and call for the generation of intuitive ideas to address this problem cycling through the phases of the 4I organizational learning process.

Police Academy A still needs to establish more benchmarks to evaluate the effectiveness of its training and in turn improve relevant business processes. For example, according to the 2012 State A Auditor General's Report, Police Academy A had not established a benchmark for the number of attempts a recruit should take to gain competency in critical skills. Greasly (2004) stresses the importance of performance measurement in process improvement by relating operational performance of business processes to strategic targets. With the relative availability of the publication of performance indicators for police forces across the nation and access to information about other regional forces, Police Academy A could utilize the information to benchmark its performance against the national average performance level in more areas than it is currently undertaking.

In addition, leaders in Police Academy A also reviewed projects or strategy implementation based on KPIs to determine if the projects had delivered the expected outcomes:

> *If we implement something, we always have a post-implementation review and there'll be a set structure, we use project management methodology. We're always seeking feedback from individual people about how it's working, how it's been received. If it's innovation with increased risk or costs, that will be used to evaluate it, and we might consider it hasn't been as successful as we thought.* (Head)

> *In terms of training and education I think the only way to evaluate is to have some KPIs and to be quite monitored about the way you look at the training or the new innovation that you've put in. I know in my area I've got a formal evaluation person that does evaluation of the training.* (Manager 3)

Linzalone and Schiuma (2015) argue that project leaders need to choose evaluation model characteristics that are consistent with the setting of project parameters to enable effective and efficient evaluation processes. These authors propose that quantitative models enable the analysis of relationships between elements and the planning of achievable effects whereas qualitative models enable the analysis of project construction. In Police Academy A, leaders tended to use quantitative models to evaluate the success of projects with the emphasis on cost

saving. In this respect, these leaders should complement evaluation with more qualitative models to capture the bigger picture of project construction enabling the identification of improvement areas in which relations between elements were not clear and the measures involved more intangible effects. This would encourage Police Academy A to pursue more exploratory innovation with longer-term financial benefits. In this way, the academy could balance exploration and exploitation.

In terms of *organizational structure* and institutionalizing, leaders in Police Academy A tended to use high degrees of centralization in implementing the reform and other innovation initiatives under the Service Definition and Resource Model (SDRM) program. Centralization is useful for radical innovation adoption because it provides management more authority to implement radical changes as suggested by Ettlie et al. (1984). Leaders in Police Academy A communicated the proposed changes and provided support for staff to face the changing of their positions in the future structure:

> *So it all comes down again to the right communication, recognising from before that there's going to be reluctance from a portion of our workforce to change, and making sure that we don't just focus all effort on the people who won't change or the negative aspects, but in fact celebrate the successes. And a multi-pronged communication strategy, so we've got lots of ways that people are being told about the change, forecast it's coming and say how good it is. Be honest, but if it wasn't good we wouldn't be changing. So engagement with our staff.* (Senior Manager)

State A Police also adopted centralization to improve company-wide coordination and reinforce corporate control, such as the centralization of the Curriculum Development and Coordination Unit (CDCU). Significant improvements in the curriculum development area have not been able to be identified yet during this study since the unit was relatively new. The academy also adopted differing structures for different areas, such as a more decentralized structure for the IT Department to enable organizational members in this area to be more responsive to external challenges by making adjustments in the institutionalization process.

In the institutionalizing phase of 4I organizational learning, leaders in Police Academy A also tried to develop an *organizational culture* or climate that facilitated the dissemination of institutionalized learning. Leaders have an important role in encouraging staff to share knowledge in police organizations (Seba, et al., 2012) and Police Academy A was no exception:

> *I think a lot of it comes down to the manager and the managers of those areas and the higher echelons in terms of how do they encourage those areas to be open and accountable? I think if you've got nothing to hide you should be accountable.* (Manager 2)

In Police Academy A, leaders communicated the reform process through face-to-face meetings, the SDRM portal, and broadcast emails (see Section 6.3.1). In terms of changes related to training and education, Police Academy A conducted training and development courses as

formal ways to disseminate new learning content. Hughes and Jackson (2007) argue that onsite training courses also allowed staff to meet informally during breakout sessions and lunch breaks to exchange knowledge. This appeared to be the case in Police Academy A where members coming from different areas within the state police interacted and shared knowledge while attending the training or professional development programs in this academy. However, Police Academy A has been increasingly shifting its training and professional programs from onsite to online delivery modes due to the budget constraints. Therefore, members might no longer have both formal and informal personal interactions during the training in the academy such that they may need to use more technology (such as emails, social media, or IdeaScale) to form communities of practice to encourage knowledge sharing in the state police.

In the institutionalizing phase of 4I organizational learning where adopted innovation is embedded in the organization, leaders in Police Academy A tried to invest in infrastructures that could provide flexibility but had to do it by applying strict adherence to the approved state budget (allocated *resources*) to deliver key services requested by the state government (see Section 6.2.5). Police Academy A tended to stick to the initial plan of an approved project's scope, budget, and schedule to enable it to deliver the requested services. However, Police Academy A would be interested in the opportunities to cut the budget during the implementation of innovation as long as it would not sacrifice the quality of its policing services:

> *And then because a lot of things come back to money, we always look at how that's impacted our budgets and financially, we're always interested, I'll be honest, if there are dollar savings attached to something, better efficiencies - that gets a big tick.* (Head)

Any changes to the scope, cost, and schedule for delivering the projects should be reported to the State A Police.

Koper et al. (2014) argue that police organizations often face cultural resistance and technical difficulties in implementing innovation. These technical issues may include less user friendly applications and the need for learning new regulations along with the new systems. In addition, police organizations often face organizational obstacles in connecting new technologies or data provided to existing infrastructures (Custers, 2012). The IT department assisted in the management of complex software integration when a technology upgrade took place, using external partners' services to deploy the technology upgrade if they could not do it internally. The role of Police Academy A would then be in providing relevant education and training in the use of the new technology being implemented to minimize the resistance to change. However, Koper et al. (2014) argue that IT training tends to focus on operational skills but neglects the strategic uses of technology. For example, the training often emphasizes how to fill the online reporting form rather than how to use IT strategically by improving knowledge sharing for

addressing crime problems. While Police Academy A needs to consider training in IT use beyond just for operational purposes, it may be difficult to achieve this in the short term given resource constraints and the prevailing silo mentality that is a barrier to knowledge-sharing.

In terms of changes in training and education technology, Police Academy A has adopted more technology to improve the delivery of its education and training courses (see Section 6.2.3). For instance, the Academy trialed the 'quiet eye' sporting technique to reduce the time it takes to train recruits to become proficient marksmen. This technique teaches recruits to slow their reaction speeds and minimize visual distractions to enable them to process the split-second decisions involved in firing a gun. To investigate the effectiveness of this technique for recruits, researchers from the partner university use a set of goggles to track the movement of recruits' eyes.

In general, leaders at Police Academy A assigned staff, created structures, and mandated the forming of project teams to institutionalize changes or innovation at Police Academy A. They also provided support for their members to undertake the changes. However, these leaders should also consider flexibility in institutionalizing changes in terms of training and education courses as well as its supporting technology so that the organization can pursue both exploration and exploitation in the future. This is because the legacy systems often hinder the adoption of new technology. In addition, any improvements of training and education content should be able to meet the evolving policing task requirements.

6.4   Chapter summary

As a public organization, of the four organizations in this study, Police Academy A faced the strongest pressures for higher efficiency due to significant reduction in government funding. State A Police had to undergo a structural reform by adopting centralization to realize synergy and improve company-wide coordination. For example, the Academy established a new centralized curriculum development unit to create and facilitate a centralized consultancy for professional development within the state police. Due to the reform process, the service delivery levels of the Police Academy A were reduced with a corresponding loss of resources. As a result, during this challenging period of change management, it became necessary for the leadership to reconsider how it might undertake a meaningful reform of training within its new resource allocation and become more directive in terms of what aspects of reform were critical and achievable. Given resource constraints, there was a big push to exploit existing resources to deliver the training in more cost-effective ways (e.g. better online training).

The police academy tended to focus on a cost-leadership strategy and improved efficiency (exploitation) rather than on a differentiation strategy (exploration) in responding to the resource-constrained environment. The police academy is not in the competitive market and

therefore it does not differentiate its services like business organizations but instead it changed its services to be more focused and efficient due to its very limited resources. This supports Cao et al.'s (2009) findings that resource-constrained organizations need to manage a trade-off between exploration and exploitation. The approach taken by Police Academy A can be associated with an approach to organizational learning ambidexterity that is characterized by higher exploitative learning coupled with lower exploratory learning.

According to Turner et al. (2013), organizations can also pursue organizational ambidexterity via three broad approaches i.e. temporal, structural, and contextual ambidexterity. At Police Academy A, temporal ambidexterity (where exploratory and exploitative modes of learning are not coexistent but follow one another) was evidenced by the pursuit of exploration in the adoption of online learning (i.e. "Collaborate") and followed by the refinement of its use into all the Academy's operations. Police Academy A also used the structural approach to pursuing ambidexterity where a separate organizational unit was explicitly responsible for exploratory activities. For instance, State A Police has a dedicated reform program structure to review its overall business processes (including the process at Police Academy A) and to provide recommendations for process improvements. Police Academy A also used contextual ambidexterity (exploration and exploitation within a business unit through a behavioral or cultural approach). For example, leaders of Police Academy A encouraged variety of ideas in the intuiting and interpreting processes through the Frontline Innovation Portal but in the integration and institutionalization processes these leaders promoted the integration of different opinions using the reform principles and high-order strategy.

Berson et al. (2006) propose that the process of intuiting and interpreting could be linked to exploration of new knowledge and the institutionalizing phase could be related to exploitation of existing knowledge. Leaders of Police Academy A promoted varieties of ideas during the intuiting and interpreting phases through various mechanisms, such as "Frontline Innovation Portal". Leaders communicated and consulted the reform program through the SDRM to achieve integration of different views. When integration was difficult to achieve, leaders used their power and authority to achieve it. Leaders also communicated new changes and provided support to facilitate institutionalization. The process of organizational learning in Police Academy A could be summarized in Table 6.2.

External Environment	How the Internal Environment responded (based on the phases of 4I Organizational Learning)		Type of Innovation pursued and approaches to ambidexterity used

• **Competition**
  o Not in the competitive market but difficult to get new recruits (the policing job may no longer be attractive)
 	
• **Customer demand**
  o Increased policing demands due to growing population and increasing complexity for policing services along with the changes in culture and development of technology
 	
• **Development of technology**
  o CCTV, CAD, Hydra, and online learning
 	
• **Strategic partners**
  o Assistance in delivering technological-based innovation (e.g. online learning) and administrative innovation (e.g. police reform restructuring)
 	
• **Government or regulations**
  o Significant reduction in government funding and dependency on government funding
	Intuiting	• Leaders stimulated individual organizational members' creativity by developing their competences and motivating them to innovate through the creation of a conducive working environment:
		  o Strategy: setting strategic priorities in people, resources, standards, community engagement, and partnerships
		  o Structure: having the reform program structure as an exploratory unit; more decentralized structure of IT department
		  o Culture: giving freedom to express novel ideas, promoting knowledge sharing for collaborative problem solving (but the "command and control" culture tended to impede bottom-up initiatives), and providing recognition
		  o Resources: the need for providing high quality policing services with less resources became the strongest driver to pursue innovation; collaboration with external innovation partners to pursue innovation (e.g. online learning and structural reform)
			• **Innovation**
			  o Mostly process innovations linked to efficiency (exploitation) i.e. incremental process improvements; however, few radical technological-based innovation (e.g. Hydra) and radical administrative innovation (e.g. structural reform) can be associated with significant process improvements (exploration)
			  o The introduction of updated education and training that enabled frontline officers to provide more focused and efficient policing (i.e. community policing) can be linked to differentiation (exploration)
			
			• **Approaches**
			
			  o Overall: focusing on a cost-leadership strategy and efficiency rather than on a differentiation strategy
			
			and also
			
			  o Temporal: the adoption of new online learning technology followed by the refinement of its use
			
			  o Structural: the establishment of the reform program structure (such as SDRM and CIT) as an exploratory unit
			
			  o Contextual: the encouragement of putting forward varieties of ideas in the intuiting and interpreting process through i.e. Frontline Innovation Portal (exploration of new knowledge) and the integration of views in the integrating and institutionalizing process through the use of reform principles and strategy (exploitation of existing knowledge).

	Interpreting	• Leaders provided a shared interpretation for guiding innovation activities and facilitated constructive dialogues to allow the acceptance of new ideas and insights:
		  o Strategy: communicating the above organization's strategic priorities and emphasized the police reform initiatives
		  o Structure: using the reform program structure and introducing programs to infuse new thinking related to the structural reform (e.g. "Frontline Innovation Portal)
		  o Culture: facilitating more two-way communications related to the police reform and providing informal and formal meetings between different groups within the academy to encourage knowledge sharing and collective interpreting
		  o Resources: sharing common interpretations related to resources (e.g. constraints on finance and legacy systems)	

	Integrating	• Leaders guided the integration of new and existing knowledge by facilitating a shared understanding at both the group and organizational level to allow for coherent and collective actions:
		  o Strategy: focusing on efficiencies and cost savings due to significant reduction of government funding but striving to adopt more community policing in its curriculum to differentiate its services from past practices
		  o Structure: using Corporate Board meetings to achieve integration at the executive levels; cross-functional teams at lower levels of management
		  o Culture: communicating the reform principle and encouraging organizational members to participate in the reform process	

External Environment	How the Internal Environment responded (based on the phases of 4I Organizational Learning)		Type of Innovation pursued and approaches to ambidexterity used
		o Resources: focusing on efficiencies and compliance with the state government's targets and requirements	
	Institutionalizing	• Leaders facilitated the organization-wide implementation and adoption of innovation as well as institutionalized new knowledge in such a way that enabled the simultaneous pursuit of exploration and exploitation: o Strategy: monitoring the implementation of innovation strategy and making necessary adjustments to respond to external changes (e.g. the need for more benchmarks to evaluate the organizational performance of the academy and the inclusion of inputs from frontline police officers in the development of training and education strategy to minimize problems in implementation) o Structure: using a centralization approach to implement significant structural changes (e.g. structural reform) and a decentralization approach for particular areas (e.g. IT Department) o Culture: enhancing communication and coordination through the reform program structure to disseminate institutionalized knowledge o Resources: Trying to invest in infrastructure that could provide flexibility but having to do it by applying strict adherence to the state budget in implementing innovation projects; providing necessary training and professional development (e.g. leadership) to upgrade existing human resources to meet existing and future needs	

Table 6.2: The process of 4I Organizational Learning (OL) at Police Academy A

Chapter 7: Hospital A - Case analysis

7.1 Introduction

In this chapter the researcher presents the data from the mini case study of Hospital A. It is a private hospital in an Australian state that caters for both private and public patients, owned by one of Australia's largest private hospital operators. According to Hospital A's 2013 annual report, the hospital had more than 2700 staff. Hospital A was chosen in this study because it had been experiencing significant levels of growth in terms of patient activity and physical infrastructure since the hospital was established in 1996. For example, according to its 2013 annual report, there was a 30 per cent increase in the number of patients admitted to the hospital in 2013. Based on its 2012 annual report, in the 12 month period between July 2011 and June 2012, attendances at the hospital's dedicated pediatric Emergency Department increased by 30 per cent. In terms of physical infrastructure, Hospital A started its AUD$393 million redevelopment program in 2009 and completed it in 2013. For the expansion of these facilities, Hospital A recruited hundreds of additional staff, acquired new medical equipment, and offered new medical services.

The data in this study were gathered from the corporate website, press releases, and face-to-face interviews with 2 staff at executive level and 4 staff at senior management level at Hospital A from January to February 2014. Table 7.1 provides a list of participants who were interviewed.

No	Participant's position
1	Director 1
2	Director 2
3	Manager 1
4	Manager 2
5	Manager 3
6	Manager 4

Table 7.1: Participants' details

In this chapter, the researcher first investigates Hospital A's external context. The researcher then analyzes how senior leaders adjusted the internal context to pursue organizational learning for innovation as a response to the external context. Using the 4I framework (Crossan, et al., 1999) identified in the literature review chapter as the framework for understanding the processes of organizational learning under the categories of intuiting, interpreting, integrating, and institutionalizing, the researcher investigates the processes of organizational learning at Hospital A. According to Berson et al. (2006), the emphasis of exploration is the 4I learning processes of entrepreneurial intuition (new learning with future orientation) and interpretation

whereas exploitation is associated with the process of institutionalization. The process of idea generation is closely linked to exploration activities. Conversely, the process of idea implementation is closely associated with exploitation activities. Leaders often faced intensified tension between exploration and exploitation in the process of integration (Berson, et al., 2006) and Hospital A's learning processes for innovation are investigated in the light of this tension. The researcher concludes this chapter with a discussion of the approaches to organizational learning ambidexterity that Hospital A has pursued in response to its external context.

7.2 External context

As per the cases in the previous chapters, in this chapter, the researcher conceptualized Hospital A's external context in terms of competition, customer demands, technology development, strategic partners, and government. These constructs were identified in the literature review chapter as having an influence on an organization's pursuit of innovation through its internal context and the underlying organizational learning for innovation.

The external context characterized by the significant influence of the state government's strategic agenda and the regulatory environment in the Australian health care industry drives much of the innovation in this case. The state government's strategic agenda to facilitate health care being provided closer to home has offered opportunities for the hospital under investigation to redevelop its infrastructure under public-private partnership arrangements. The redevelopments significantly expanded the range and breadth of clinical services at this hospital and this enabled the hospital to catch up with its rapidly growing community. The local population of around 340,000 in 2013 is projected to grow to more than 500,000 by 2020. According to Macri (2016), the demographic changes like an increasing ageing population and rapid urbanization have posed significant issues on the access of healthcare services. The offering of new clinical services, such as a new antenatal clinic which had not been offered previously, could be associated with exploratory innovation. In addition, as a private hospital, the hospital also needed to differentiate its services between public and private patients to enable it to compete with other private hospitals. In 2013, with the funding support from its parent company, the hospital completed the redevelopment of its private hospital facilities to provide better services for its private patients. The hospital also adopted technological-based innovation to provide a better health care experience to its patients. For instance, in May 2014, the hospital's cardiac specialists performed the first procedure of its kind in the state, implanting the world's smallest cardiac monitor into patients who experience an irregular heartbeat.

In the context of tightening government budgets and increasing costs in the provision of health care services in Australia (Macri, 2016), the challenge for this hospital was to provide excellence health care services that not only would improve the health and well-being of patients but also had to be cost-effective treatments because around 70 per cent of its patients

were public. Under the public contract, the state government specifies an annual maximum operating budget for required levels of activity and the services to be provided to public patients. The hospital will only be paid for each activity or patient treated. As such, most innovations in Hospital A could be associated with process innovation linked to efficiency (exploitation) i.e. incremental process improvements. However, some of these process improvements involved significant business process changes and organizational members of Hospital A considered these radical process improvements as exploration. For example, the hospital had to meet the National Emergency Access Target (NEAT) and this has promoted significant improvements of its emergency service deliveries. The hospital has achieved a significant time reduction in its bed management systems by streamlining the process. The average time from patient needing a bed to notification of the allocated bed has decreased to seven minutes whereas previously it took about an hour. In this way, exploration activities at Hospital A does not only relate to new medical services or a differentiation strategy but also radical process improvements aimed at increasing efficiency. Although the hospital tried to pursue both cost-leadership and differentiation strategies simultaneously, it tended to focus on efficiency rather than on product differentiation in the context of a resource-constrained environment.

In the following sections, the external factors that drove the pursuit of innovation will be examined in detail, starting with competition.

7.2.1 Competition

Increased competition requires firms to achieve higher efficiency by pursuing innovation (Desmet & Parente, 2010). Healthcare organizations need to be aware of what their competitors do to be able to survive in a competitive market (Thakur, Hsu, & Fontenot, 2012). Nevertheless, health care competition tends to be local (Porter & Teisberg, 2004). Patients prefer to have medical care near to where they live, and are often referred to nearby hospitals by physicians, provided the medical care can be undertaken there. Hospital A is located in one of the Northern suburbs in the State, around 30 km from the State capital's Central Business District (CBD). Competition with other hospitals and health care demands in the north metropolitan area of the State and surrounding areas could affect Hospital A's strategy to pursue innovation:

> *It depends what happens with some of the other smaller hospitals [in the north metropolitan area], whether they're developed to be bigger hospitals or reduced to be smaller.* (Director 1)

The potential demand in the market would be affected by the changes of the nearby hospitals' capacity to capture a fraction of the demand. Other hospitals may improve their quality of care and/or increase their capacity to take more patients in an effort to get greater market share.

According to the State's Department of Health, there are 35 hospital services within the metropolitan area consisting of 16 public hospitals and 19 private hospitals. In the north metropolitan area, there are 6 public hospitals and 10 private hospitals. According to North Metropolitan Area Health Service of the State (NMAHS), the north metropolitan area is approximately 3,000 square kilometers with almost one million people or 40 percent of the state's population. Based on its strategic plan for 2012-15, NMAHS has been striving to facilitate care being provided closer to home and it provided opportunities for Hospital A to pursue innovation by offering new clinical services:

> *There'll be lots of changes in health in [the State]... It's potentially an opportunity for us because they (the State Government) really need to set up a major center in the north, the middle and then in the south (of the CBD). So there could be opportunities for us to do more and provide more services than we're currently providing.* (Director 1)

> *The other pressures are at one point the [major hospital B] in the CBD was planned to close. Of course that meant that people who aren't going there are either going to go somewhere else, like they might go to [major hospital C], but they might go south if they live closer to home or the southern side, or they might come up north. So there are those kinds of pressures that come on us to have to meet those needs.* (Manager 1)

NMAHS has undertaken major infrastructure programs including the redevelopments of [Medical Centre D] located in one of the suburbs around 7 km's from the CBD, the construction of Health Campus E in one of the north-eastern suburbs, and the redevelopment of Hospital A in the State's northern suburbs. In addition, the South Metropolitan Health Service has completed the development of the AUD2 billion major hospital F in one of the growing southern suburbs. Based on its 2013 annual report, Hospital A expanded to include the following facilities: mental health unit in 2009, emergency department in 2011, new ward block in 2011, special care nursery in 2011, operating suite in 2012, critical care in 2012, radiological clinic in 2012, cardiac catheter laboratory in 2012, private hospital in 2013, specialist medical centers in 2013, clinical school in 2013, antenatal clinic in 2013, after hours GP (general practice) clinic in 2013, and a child care center in 2014. Thus, the redevelopments significantly expanded the range and breadth of clinical services at Hospital A. The hospital is also offering new clinical services which had not been offered previously and such exploratory innovation provided Hospital A with a competitive edge against its competitors.

In addition, Hospital A was stimulated to increase efficiency by pursuing innovation, based on what other hospitals in the region had done in relation to meeting the state government standards:

> *We look at other hospitals and what they've done, look whether they're a fit with us, customize that and put that into place.* (Manager 1)

Hospital A strived to achieve and maintain its health performance at the level required by the state government because since 1996 it has been contracted by the state government to treat

public patients, especially those who live in the State's northern suburbs. The state government provides a health performance report quarterly each year to monitor the State's health performance, particularly in the areas of emergency demand, elective surgery, outpatients and mental health. Hospital A used this information (such as the average health performance for particular clinical services) to benchmark its performance. Although benchmarking can sometimes lead to exploratory innovation (for example when the hospital's health performance was below the average), Hospital A used the benchmarking to improve its existing services in pursuit of mostly exploitative innovation, such as incremental process improvements:

> *We always want to be number one. I suppose in relation to things like customer satisfaction we would always want to know where we're sitting. We don't always get that information because the information is not always given as a breakdown for the different hospitals, but we know where we sit in relation to everybody else. So we will review the information that we're given, and try and break it down and see if there's anything we can actually implement to make that particular area better.* (Manager 2)

However, while local competition has driven some process innovation in Hospital A which can be associated with exploitation, the biggest driver of technical or medical exploratory innovation appears to be global best practice:

> *We do take into account what our competitors do, but certainly from my area, a lot of our innovation's driven by best practice around the world. It's what's best for the patient.* (Director 2)

The perceived pressures of best practices guided by benchmarking hospitals can stimulate a hospital to innovate (C.-W. Yang, 2015), particularly in the area of medical innovation. Wu and Hsieh (2015) propose that medical innovation involves technology and method directly related to the primary activities of diagnosis, treatment, and prevention of diseases in hospitals.

In summary, local competitive pressures complemented with the State government's initiative to provide health care closer to home have promoted the redevelopments in Hospital A and in turn the offering of new clinical services which it had not offered previously and this can be associated with exploratory innovation. The competition to win the state government's contracts to serve public patients has encouraged Hospital A to achieve higher efficiency to meet the government's standards and compliances.

7.2.2 Customer demands

Customers' demands can encourage innovation (Godin & Lane, 2013). According to the NMAHS's strategic plan for 2012-15, there have been growing demands for health services in the northern and north-eastern suburbs and NMAHS has been striving to provide health care closer to home (see Section 7.2.1). One of the NMAHS's projects included the redevelopment of Hospital A, which started in 2009 and was completed in 2013 under a public-private partnership between the State Department of Health and Hospital A. New clinical services

which could be linked to exploratory innovation were often driven by the state government's requirements that reflected the community's health care needs:

> *A lot of that [clinical services] is driven out of what needs are there out in the community, what needs are there that the government wants us to take on.* (Director 1)

However, the establishment of the private hospital in Hospital A in 2013 was an internal initiative arising from customer demands for private health care:

> *We had private patients but they were sitting across the hall or in the same wing as our public patients – that doesn't allow for very good differentiation of a product – so through the Executive, and particularly through the CEO's work, we put a case up for saying, "We need a private hospital and we would like to build one here". We needed to differentiate those two products – people who were paying money to a private health fund. While the delivery of care is the same, private patients want to stay in a nicer environment, nicer room, with nicer food, seeing the doctor of my choice, and those sorts of things.* (Manager 1)

As the move to offer the private hospital was something entirely new to Hospital A, it could be associated with exploratory innovation. Jansen et al. (2006) argue that the introduction of new services for new customers can be linked to exploration.

As part of the public contract with the NMAHS, Hospital A needed to respond to inputs from the Community Board of Advice about the direction, development, services and management of the hospital. The board members consisted of the hospital's executive management team representatives, community representatives, representatives from the local council, the state government, and other related stakeholders. The board members who were representatives from the community also gave suggestions on behalf of patients, particularly patients from the local community reflecting local customers' demands:

> *There are members on that board from the community who will be giving us a consumer perspective all the time on what we're doing.* (Manager 2)

In other instances, Hospital A also used external data to identify customers' demands:

> *We've got data, there's something that's called Hard Starter that tells us where patients go for different procedures. So we could look at that data and say, "Well, there's a lot of people in the northern suburbs that are going down to the city to have their tonsils out or whatever it might be," so we need to provide that service here so that they don't need to travel down there anymore.* (Director 1)

In addition, Hospital A had various internal mechanisms to seek feedback from its patients to enable it to meet the patients' needs better:

> *So we've got patient feedback forms and our patients are given education on what to do if they're not happy about any part of their treatment, and that can be from raising it with the nurse that's looking after them or indeed the manager of the ward. Or, if they don't feel confident to do that, we tell people how to reach our consumer liaison officers. We also try and go round as much as we possibly can, as a nursing executive*

team. I myself will do some patient rounds and just randomly ask for feedback on how we're doing, and that can be anything from the treatment to the meal. (Director 2)

In this respect, Hospital A has committed to improve its services for the benefit of patients by pursuing both exploratory innovation in the form of offering new service and a private hospital and exploitative innovation to improve existing services, as stated in its slogan "Putting patients first". This is in line with the idea of Tsai (2013) that hospital administrators should emphasize the customer orientation by adjusting services according to customers' demands, especially when facing competition.

However, the patients' inputs could be less valuable for guiding exploratory innovation like the adoption of medical innovation because patients often lack knowledge about new medical treatments:

> *Often from a patient's perspective, they don't know what their expectations are anyway about coming into hospital. Often it's a first and only time that they'll ever have to do it, so the experience is new. Our challenge is to make sure that it's incident free and we do the best thing by them at all times, and make them feel comfortable and secure* (Director 1)

Such indication corresponds with Knudsen's study (2007) that customers tend to provide ideas that are bounded by their own experiences. However, physicians can serve as patient advocates in recommending a particular medical treatment (Stafinski, Topfer, Zakariasen, & Menon, 2010). Tsai (2013) also argues that hospitals need to pursue medical innovation by doctors acquiring new medical skills and hospitals having high-tech medical equipment to assist with medical treatments. Hospital A appears to have adopted high-tech medical equipment to enable it to deliver the best health care services to patients. In some cases, the adoption of high-tech medical equipment can lead to new services that could be considered exploratory innovation for a hospital. Hospital A has thus tended to emphasize treatment-based medical innovations. However, Hospital A has to improve its IT infrastructure to improve its overall service processes within the hospital and in turn better satisfy customers or patients (see further discussion in Section 7.2.3). Tsai (2013) found that hospitals focus more on medical innovation or exploratory innovation facilitated by technology rather than managerial or administrative innovation to satisfy customer demands for better health services. However, administrative innovation is also required because it has significant impact on improving interactive relationships between medical personnel and patients and this has been increasingly recognized as the key determinant of customer satisfaction (Wu & Hsieh, 2011). For example, improved computer-based registrations and admissions can increase patient satisfaction in terms of non-medical service activities, and this is an example of administrative innovation which is exploitative.

In conclusion, customers' demands have influenced innovation at Hospital A but the introduction of new clinical services at the hospital was significantly affected by the state government due to the public-private partnership arrangement. Although patients often had lack of knowledge or experience in regard to medical treatments to directly demand for certain services that could be deemed exploratory innovation, the adoption of new high-tech medical equipment at Hospital A was stimulated by the customer needs of a particular medical treatment and based on what the global industry standard was for that treatment.

7.2.3 Development of technology

It has been widely recognized that technological advancement can promote innovation (e.g. Danneels & Sethi, 2011). For example, the development of health technology has provided opportunities for hospitals to offer better quality of care. New surgical technology is not confined to hardware and it can include a technique, a procedure, or a process of care. In Australia, the adoption and diffusion of new technologies in the health sector are often driven by medical practitioners, including surgeons (Gallego, van Gool, Casey, & Maddern, 2013) and this appeared to be the case at Hospital A:

> *That would come mainly from our practitioners. It might be from our general surgeons in the area of robotics, for instance. They might have had some exposure to robotics at another hospital or they might have attended a conference and they would bring that idea back to us as an executive.* (Director 2)

In 2013, Hospital A had acquired one of the most advanced MRI (Magnetic Resonance Imaging) scanners in the State's northern suburbs. In addition, the hospital's cardiac specialist had been able to implant the world's smallest cardiac monitor into patients who suffered from an irregular heartbeat. This procedure was claimed to be the first of its kind in the State in 2014. The adoption of this surgical technology which was new to Hospital A could be associated with exploratory innovation offering competitive advantage for the hospital. In this way, hospitals will be able to compete in wider outreach to offer more diversified offerings, as proposed by Porter and Teisberg (2004). However, while the adoption of new technology in healthcare is innovative, any such adoption should consider the economic value and the effectiveness of new health services as measured by an improvement in the patients' health status (Lettieri & Masella, 2009). This may suggest that the cost of implementing innovation could be prohibitive and this has become a concern for senior management at Hospital A in making decisions about new medical technology:

> *We tend to be a bit of a follower rather than a leader with some of that stuff because of the cost, and you need to determine that there is going to be a benefit for the patient in doing it.* (Director 1)

The adoption of a new medical technology often requires new practices or routines to be implemented (Lettieri & Masella, 2009). Thus, medical innovation in the form of adoption of

new technology for treatment can lead to the changes of physical settings and organizational structure used to deliver the treatment (Wu & Hsieh, 2015). Medical innovation could therefore stimulate managerial changes or administrative innovation in hospitals. In service organizations, product or process innovation could promote administrative innovation because work procedures and practices are often changed due to changes in services (Bloch, 2007).

Administrators in Hospital A tended to focus on treatment-based medical innovation rather than administrative Information Technology (IT) innovation. However, there had been increasing concerns about the need for improved IT systems by senior management in Hospital A:

> *More and more I find that IT plays an absolutely fundamental part in a lot of what we do today, because the rate at which the industry is moving from a data point of view and everything, is electronic. The systems and processes I think that we've historically had, we've been behind the eight ball a lot, we've been playing catch-up in health overall, and we're doing a lot of rework from an IT point of view, trying to bring us up to speed as to where we need to be today.* (Director 2)

> *We have lots of issues with IT, lots of issues with the systems that we use, particularly for our patient management system, but that's being reviewed at the moment and we need a lot of change.* (Director 1)

Improvements in Hospital A's existing IT systems can provide many benefits for the organization. For instance, improvements in clinical information systems would enhance the hospital's decision making process by providing historical data analysis in a timely manner:

> *At the moment historic data, it's a big job for us to get it out, now [if we're using the current technology] we'd have the capacity to look at trends and gauge things in a much more timely fashion.* (Manager 3)

In addition, improvements in IT systems can facilitate a more effective work scheduling system for their employees. Such process innovation in the work scheduling system contributes to the bottom-line of Hospital A, enabling the most productive use of its employees:

> *Now the organization is so big, having an IT system that would actually support rostering would be one of the big keys, because we're also at risk of losing money by not having the correct amount of staff.* (Manager 2)

Nevertheless, in Hospital A, IT projects for administration often failed to compete with other projects directly related to the medical care of patients due to limited resources:

> *So for the last couple of months for example, we're not getting in as much money as we'd like, so we are really restricted. We can't progress any new changes to our organization until such time as we have the money to actually support those changes.* (Manager 3)

In summary, the development of technology has promoted innovation at Hospital A but mostly in the form of the acquisition of new surgical technology offering innovative medical treatments in the region. However, although both IT manager and hospital executives at Hospital A welcomed the adoption of IT innovation to support the administration side of the hospital, the limited budget has restricted Hospital A to pursue exploratory IT innovations, such as the adoption of advanced clinical information systems.

7.2.4   Suppliers and strategic partners

External innovation partners can assist organizations to explore new initiatives (Schamberger, et al., 2013). Hospital A collaborated with medical equipment suppliers to provide better medical treatments:

> *We do have reps that will visit the hospital and promote the newest technology.* (Manager 2)

Chao et al. (2013) argue that trust is essential to foster commitment between hospitals and medical equipment suppliers and open communication and perceived benefits are believed to be able to improve the levels of trust. In Hospital A, the representatives of medical equipment suppliers visited the hospital to communicate with physicians openly and convince them about the benefits of the new medical technology. As a result, Hospital A had been able to adopt cutting-edge technology that could lead to the implementation of new medical practices or procedures (see Section 7.2.3). Hospital A often had to cooperate with external partners to deliver the relevant training in the adoption of new medical technology. In this way, Hospital A pursued exploratory innovation by introducing new or significantly improved health services, such as the implant of the smallest cardiac monitor mentioned previously.

Hospital A also established a Community Clinical School in 2013 and this was enabled by the partnership between the hospital's operator, the Federal Government, and three of the State's public universities. The establishment of a community clinical school could support the achievement of the organization's goal of becoming a tertiary hospital:

> *We decided we wanted to start a clinical school up here with the universities because that's going to give our hospital more credibility and turn it into a tertiary hospital one day.* (Director 1)

Hospital A welcomed any researchers who wanted to do research at the hospital as long as they met the hospital's ethics requirements. One of the respondents expressed her willingness to collaborate with university researchers in pursuing innovation at Hospital A:

> *I would like to think that we could have more of a research team that worked closely with us and could guide and help us.* (Manager 4)

Hospital A also provided training for medical students through clinical placements, including specialties of Surgery, Anaesthesia, Emergency Medicine, Psychiatry, and General Medicine. The collaboration between Hospital A and universities in the State could strengthen the research partnerships and in turn could lead to innovation. For example, the establishment of a Nurse Research Consultant position between Hospital A and one of the State's public universities enabled the development and implementation of evidence-based practice in the Emergency Department. In addition, Hospital A worked with another university in the State to offer a cardiac rehabilitation program that provided a holistic rehabilitation program incorporating both health education and exercise. Goes and Park (1997) propose that hospitals are more likely to innovate if they are linked with institutional associations where the hospitals and organization partners view mutual benefits from the interaction of gaining resources or legitimacy. In this respect, Hospital A and university partners were in mutual relationships, with both parties needing each other and this could help Hospital A's innovation endeavors. The hospital also collaborated with other external innovation partners in conducting research in the health care areas. For example, in association with the Telethon Kids Institute, the hospital was undertaking a study involving mothers and their babies to investigate how early environments influence the risk of a broad range of diseases.

In summary, Hospital A has worked with various external partners enabling it to pursue innovation. It collaborated with medical equipment suppliers to adopt new medical technology to pursue exploratory innovation by delivering new health services. Hospital A also cooperated with several universities in the State in the areas of teaching and research.

7.2.5 Government or regulatory environment

Firth and Mellor (1999) argue that regulation influences innovation by changing organizations' contexts and in turn affecting innovation choices within an industry. Hospital A has had a long standing contract since 1996 with the State Government to treat public patients. Therefore, Hospital A was strongly linked to NMAHS's strategic priorities and had to meet the government's standards:

> *What's happening with the state in terms of the government and Department of Health, the direction that they're taking on any particular thing. The North Metro Area Health Service – we are strongly aligned to them.* (Director 2)

Hospital A also aligned its initiatives to the State Government's Clinical Services Framework:

> *We also consider the clinical services framework which is the state government's clinical framework regarding clinical services.* (Director 1)

According to its strategic plan for 2012-15, NMAHS's strategic priorities have been guided by the State Health Clinical Services Framework 2010-2020. The state government strived to meet

the growing health care demands in the northern suburbs through new infrastructure. In this respect, Hospital A identified the opportunities and negotiated with the State Government to redevelop its health facilities. For example, a senior leader at Hospital A described how the hospital brought about the redevelopment of its Emergency Department:

> *We were putting twice as many patients through a very small area and it actually wasn't safe, so there was a lot of negotiation done with the Department of Health and the government agencies that we report to, about getting funding to build a new emergency department. That took a number of years to be able to do all that work and demonstrate this is what needs to happen, and we've now got a new emergency department.* (Director 1)

Based on Hospital A's 2013 annual report, the redevelopment of Emergency Department was completed in 2011 with 56 bays and for the first time separated facilities for adults and children. This could be associated with exploratory innovation as it involved a whole restructure of the department and the way the emergency services were provided, which was new to Hospital A.

Chambers et al. (2013) argue that hospitals often need to pursue innovation to comply with government regulations. The government's standards and targets mainly stimulated increased efficiency in Hospital A through the pursuit of process improvements. For example, according to NMAHS's strategic plan 2012-2015, Hospital A was required to meet the National Emergency Access Target (NEAT) of 85 percent of patients admitted or discharged within four hours. At the time of the interviews, the target was to be raised to 90 percent in 2015. The NEAT target influenced Hospital A to improve its effectiveness and efficiency in delivering emergency services:

> *When someone puts a goal out for the hospital, which is to meet what's called NEAT targets, that's a really big challenge. So, people need to innovate at work and say, "Well, what we're doing now is not meeting the challenge. We need to do something differently."* (Manager 1)

It was stated in the NMAHS's strategic plan of 2012-15 that Hospital A had not been able to achieve the NEAT of 85 percent as of March Quarter 2012. As a result, Hospital A strove to meet this target by pursuing innovation. For example, one of the hospital's initiatives was to separate serious and non-serious patients at the Emergency Department Admission to speed up the patient treatments (an example of process innovation):

> *We have something that's just opened this week, which is a special admission unit which is designed to take patients out of the emergency department but not on to a ward, to make sure that if they can be treated and discharged and go home they don't block up the system. So we park them off to the side while serious ones go through to admissions and not serious ones can be discharged.* (Manager 1)

In addition, the process innovation in Hospital A has brought significant benefits to the operation of the hospital. One of these benefits is in terms of the significant time reduction in its bed management system:

> *We looked at the process for a patient in ED [Emergency Department], when they needed to get the bed notified to our bed manager, because we're one of the only hospitals that actually don't have an electronic bed management system – everything is done either manually or by pager or by telephone call. So we reviewed the process to see how it was currently being done and we were able to eliminate some waste there, so we know the average time from patient needing a bed to notification is now down to seven minutes, whereas beforehand it was up to an hour.* (Manager 2)

While process improvements are often associated with incremental innovation, significant changes to business processes can be categorized as radical innovation (Davenport, 1993). As such, the state government's standards and targets could also stimulate business process reengineering related to exploratory innovation in Hospital A like the significant changes to its bed management systems mentioned above. However, the scope for Hospital A's initiatives was often restricted by the public contract with the State Government. New initiatives at Hospital A were often limited by the government's funding framework and Hospital A was dependent on the state government because around 70 percent of its patients were public patients. For example, the introduction and expansion of clinical services at Hospital A were strongly aligned to the public contract with the state government:

> *We don't just change the contract obviously, we go back to the contract manager and say, "Look, this is what we're seeing. We would actually like to offer this service or grow this many services. Will you support that?" If they say, "Yes"- great. If they say, "No" - that's the way it goes.* (Manager 1)

In conclusion, the government's standards and targets have affected innovation at Hospital A. For example, the state government's project to provide health services closer to home offered opportunities for Hospital A to expand its range of health services. In addition, the government's regulations mainly stimulated increased efficiency in Hospital A leading to process improvements. However, new initiatives at Hospital A were restricted by the state government's funding framework and strategic plans.

7.3 Four I framework

In the following sections, using the 4I framework, the researcher examines how leaders of Hospital A adjusted the internal context in response to its external context in determining organizational learning for innovation. The internal context of the hospital has been conceptualized using elements identified in the literature review i.e. strategy, structure, organizational culture, and organizational resources.

7.3.1 Intuiting

During the phase of intuiting of 4I organizational learning, leaders should create an organizational context that encourages intuition of organizational members (Berson, et al., 2006). At Hospital A, the CEO directed the efforts of individuals in the intuiting process. The CEO was credited as the source of entrepreneurial intuition (new future-oriented learning) for the redevelopments in Hospital A. This is supported by the following comments:

> *It's from the top down, from the CEO down. He's always very passionate about redevelopments and things like that, but all staff are involved in pushing it forward.* (Director 1)

> *The CEO says "Look, we want to have a good standing in the community, we want to deliver good care, that's something that's quite important to the minister. We need to get on board with that." And so he'll be a driver of that.* (Manager 1)

It appears that the CEO played an active role in driving innovation at Hospital A. The CEO recognized the need for pursuing innovation to respond to the external challenges and thus encouraged his followers to learn and innovate. Customer demands coupled with the local government's initiative to provide health care closer to home stimulated the redevelopments in Hospital A.

The CEO and other senior leaders conducted environmental scanning to develop *strategic* priorities that fit with the external environment with the help of the Community Board of Advice. This board provided advice on Hospital A's strategic direction in regards to the delivery of services to public patients of a range, quality and responsiveness reasonably expected by the local community (see Section 7.2.2). Some inputs included a service expansion plan, National Emergency Access Target (NEAT) updates, engaging with patients in accordance with the National Safety and Quality Health Service Standards, redevelopment updates, and results of public patient surveys. Due to its public-private partnership arrangement, Hospital A's strategic direction was influenced by the state government's agenda significantly. However, Hospital A also established a new private hospital as an internal strategy resulting from customer demands in the region and this strategy was separate from the state government's plan (see Section 7.2.2):

> *Building the new private hospital was purely about developing private business on site.* (Director 1)

The CEO had a significant role in driving innovation strategies at Hospital A, aiming to generate sustainable levels of profitability by providing high quality healthcare to its patients. As such, the CEO helped his members view their work differently by challenging existing ways of doing things. This is confirmed by the following comment:

> *We have a chief executive, he does drive those changes. He's always pushing down to look at different things that we can do to improve.* (Manager 3)

Using the organization's strategic priorities, the CEO and other senior leaders gave a sense of direction to inspire organizational members to generate new intuitive ideas and insights.

While radical initiatives at Hospital A were often driven by the CEO and other senior leaders through the organization's strategic priorities, some initiatives were proposed by organization members from lower levels of the organizational hierarchy across the hospital:

> *A number of larger initiatives have come through from the CEO, but a number of them come through from lots of different places. Pressures in various work areas surface, so we need to find a better way of doing something.* (Manager 1)

> *That [innovation] can actually come from a number of people. It can come from various levels throughout the organization. Generally, it's probably a team leader and senior team leader level where the actual drive will happen.* (Manager 2)

However, these intuitive ideas were often vague and imprecise when it came to specific actions. According to Crossan et al. (1999), it is through further articulation of the intuitive ideas to one's own self and others in the next stage of interpreting that intuitive ideas further materialize to be more concrete.

To encourage organizational members from lower levels of management at Hospital A to put forward intuitive ideas, leaders made additional *structural* arrangements that enabled feed-forward learning to complement existing hierarchical structures. This is in recognition that frontline employees may have intuitive ideas or insights but often struggled to channel-up their ideas to the top management:

> *People at lower levels are the ones that recognize that there are problems, so often it's not an immediate one when it comes from down there, because the truth of the matter is they don't have as strong a voice as people up the top pushing down, but from this sort of level they go via their supervisors.* (Manager 3)

Immediate supervisors sometimes failed to recognize the potential ideas from their subordinates and did not put the ideas forward to the higher levels of management. In such cases, lower levels of management could channel their ideas using other mechanisms:

> *Because a lot of the ideas are put forth by the managerial level, if you didn't particularly get along with your manager your voice might not be heard. It's up to the manager to bring that forward. But hopefully the way our hospital is run, people would know if they can't go to their manager they can go to their manager's manager and be able to put something forward that way. It might discourage somebody if they thought that they weren't going to be listened to.* (Manager 2)

For example, Hospital A had a formal cross-functional meeting that could be used for its organization's members to express their thoughts or put ideas forward:

> *We have team leaders meetings every week, and it's the leaders of all of the teams, so that's all the ward managers, all of the health managers, even from engineering managers, everybody all comes together and we have a presentation from each one of*

our groups. We take it in turns every week. Plus we also have the executive there and we have the CEO there, so it is a really good opportunity if you have a new idea – that's where you can present that idea. And you have the ears of the important people from the organization, the people who essentially have the power to make that change or have the power to say "Yes, this change can happen." (Manager 2)

Hospital members from different units often worked together forming cross-functional teams to develop innovative solutions to the problems of the hospital. Hospital A also had a specific area which strived to ensure safety in the hospital and to meet accreditation standards. The Clinical Governance Framework was part of the parent company's standards. This area facilitated feed-forward learning so that organizational members could submit intuitive ideas or insights and this promoted the pursuit of process improvements in the hospital:

We have an area called Clinical Governance which is charged with managing a number of areas, particularly to do with safety and risk in the hospital and meeting standards for accreditations. Within that component of Clinical Governance, we're continually looking to improve what we do, so continuous improvement processes and expectations. Now they have something called an OFI which is an Opportunity for Improvement which is a template and form that managers and staff can have access to, which, if they've thought of something or had an idea about something, they can then complete and submit that, which then goes to the appropriate area to be reviewed. (Manager 1)

Hospital A also had a formal policy review that enabled hospital members to question the established policy or procedure and this could promote feed-forward learning and in turn exploratory innovation:

In all of our policies and things like that, they are reviewed. As part of the review process there is a stakeholder group that is consulted, and indeed, when we're implementing a new policy, we'll have a wide stakeholder group. If I was a staff member and I think "Okay, this policy actually impedes me from having some innovation", I can go to the owner of the policy and say, "For the next review, can you please ensure that this is covered or I would like to bring forward this idea and I think that this policy restricts it". (Manager 2)

In addition, Hospital A strived to decentralize decision-making for innovation whenever possible to promote feed-forward learning and innovation. However, the decision-making processes for budgeting and compliance with regulations at Hospital A were relatively centralized and top-down, as illustrated in the comment below:

Some of the changes I implemented here, there really wasn't an awful lot of consultation necessary in the sense that I didn't have to ask permission. I could innovate these things myself, but I just had to make sure that it was clearly articulated to everybody else, that when I make a change, you have to find out who it impacts and as long as those people are advised and consulted, then there really is no problem about actually getting a decision made, because you have the capacity and the power to make those decisions. (Manager 3)

Any innovation is done very collaboratively, so if we agree as an executive on a particular way forward, or a particular innovation that needs to happen, we're all

given our own distinct roles within that process and what we're in charge of, and then it's up to us to make it happen essentially. So we're not micro-managed and we're empowered to make our own decisions on, I suppose, the piece of the pie that we're in charge of. We're empowered to make that happen ourselves and do what we need to do. (Director 2)

Hospital A also established a Patient Flow and Clinical Redesign function to be more process innovative in order to ensure the consistent attention and availability of resources for improving patient flow and clinical processes in the organization:

Patient Flow is to ensure a smooth transition of patients through the hospital from whatever source of admission, be that direct admission from a consultant, or through our emergency department, or any other mode of arrival, all the way through the hospital through to discharge. Clinical Redesign is looking at all of the processes that we have in the hospital, seeing if there's any waste we can eliminate, and also seeing if there's any current problems that we can maybe look at a process redesign in order to get better results. (Manager 2)

By allowing for process redesign, the Patient Flow and Clinical Redesign function supports the argument of Labitzke et al. (2014) that a dedicated innovation function can positively influence innovation activities in hospitals. At Hospital A, the Patient Flow and Clinical Redesign function has provided a space and resources for new intuitive initiatives to get started. Having a dedicated function to explore innovation initiatives in the area of patient flow and clinical redesign could assist the hospital to retract from the tendency towards exploitation of existing competences in this area. This is an example of the hospital's attempt to balance exploitation (process or incremental innovation) and exploration (new medical services) activities through a structural ambidexterity approach i.e. using organizational structure to allow for both exploratory and exploitative activities.

In addition to structures, organizational *culture* or climate also influenced the intuiting process at Hospital A. According to Berson et al. (2006), leaders need to build an organizational culture or climate that promotes intuition. At Hospital A, this was achieved by senior leaders trying to be approachable to all organization members so that frontline employees are given more opportunities to express their intuitive ideas or insights to the top management:

Executives have pretty much an open door policy, anyone can come in and visit any time, whether it be a doctor or whether it be somebody from the catering department. (Director 1)

Hospital A's senior leaders welcomed new intuitive ideas for change and would support these ideas as long as they were justifiable. Some leaders also provided opportunities for their members to try a new approach and tolerated failures to promote intuition:

We always have new people coming to work here that have travelled, have been out there, and I would always give people a fair say to talk about what they might want to implement. Even if it's only something small, generally speaking there's no reason why

they might not be able to trial it in their own little area and see how that works, and then if that's proven successful, they can then present to a broader audience and see if we want to roll it out. (Director 2)

Generally people in my teams would have the same kind of ethos about things, that we can make a change. With every change comes positivity and some negativity, but it's taking the negative and turning it around into a learning and then making it a positive. (Manager 2)

In addition, at Hospital A, organizational members could have different views and they respected each other's opinions. It was common for organizational members from different functional units across the hospital to have different perspectives, skills and knowledge. Hospital A valued diversity and with respect for differences being part of the organizational culture, this certainly helped staff to develop knowledge sharing and collaborative behaviours to stimulate intuitive ideas:

Everybody has a voice and the positions that they play are very important, so those conditions that people work in really encourage that interaction and collaboration. (Director 2)

In addition, leaders at Hospital A also recognized staff who contributed their ideas to improve the hospital's processes and the quality of healthcare for better customer satisfaction:

We don't have a formal reward and recognition system specifically for innovation but we have lots of ways to reward and recognize people, whether it be departments or individuals. We give them movie tickets, bottles of wine, time, or study leave – there's a whole lot of different ways – public acknowledgements, things like that. (Director 1)

In this way, leaders at Hospital A strived to encourage more variety of intuitive ideas from lower levels of organizational hierarchy in the intuition process.

However, in the intuiting phase, organizational *resources* often limited the range of intuitive ideas that could be considered for implementation by Hospital A. Similar to the other organizations in the previous case analysis chapters, financial resources was one of the significant factors in determining the adoption of innovation in Hospital A:

Well, we obviously have to take into consideration potential financial constraints. (Director 2)

We are obviously like any organisation, we are fiscally impeded. We can't just go and build new things because it suits us. (Manager 3)

However, the customer demands for better quality healthcare often pushed Hospital A to pursue medical innovation which required the adoption of high-cost medical technology. The adoption and diffusion of new medical technologies at Hospital A were often driven by medical practitioners with relevant skills who collaborated with medical technology suppliers (see also Section 7.2.3):

We get a lot of pressure from the doctors too because the reps go and visit them and show them all their latest toys that are available. (Director 1)

The budgeting process for adopting new technology involved a bottom-up approach to gather intuitive ideas about the real technology needs from the frontline members like medical practitioners at Hospital A:

We have a hospital-wide budget for purchasing of equipment, so most departments give us an idea of what sort of things they may want to buy next year. They don't have to necessarily stick to the wish list they put in. We don't allocate a budget per department on capital – they submit an application form and there's an approval process that comes to me. (Director 1)

In this way, Hospital A's leaders strived to encourage their members to pursue medical innovation to enable the hospital to provide excellent healthcare which could be considered exploratory innovation if it entailed services not offered previously. To overcome internal resource scarcity in the hospital, the CEO had to be innovative in securing funding from external parties e.g. the hospital obtained external funding from both the parent company and the government for the redevelopment initiatives.

Thakur et al. (2012) propose that hospitals need to adopt more IT because of the increasing role of IT in medical practices. In addition, the adoption of IT for administrative purposes (administrative innovation) can improve patient satisfaction in terms of non-medical service activities (see Section 7.2.3). However, the limited resources appeared to encourage organizational members to pursue exploitative IT-enabled innovation using existing resources:

Where you could introduce innovation with the existing resources that you have and they can see positive change, then they are very, very supportive. (Manager 3)

In general, senior leaders had a highly significant influence in promoting the intuition of organizational members through strategy, structures, organizational culture, and resource allocation. The CEO was often credited as the originator of redevelopment initiatives at Hospital A. The CEO and other senior leaders shared the hospital's vision and strategic priorities to inspire their organizational members to develop intuitive ideas to achieve the organization's goals. As such, the source of intuitive ideas could come from either top or lower levels of organizational hierarchy. Senior leaders strived to provide more channels for lower levels of management to express their intuitive ideas to the top management through structural arrangements, such as through the use of formal cross-functional meetings with senior leaders. Functional leaders were also given some levels of autonomy to make decisions related to innovation to promote more intuition. Senior leaders also established a dedicated function to explore new intuitive ideas in the area of patient flow and clinical redesign and this was an

attempt undertaken by the hospital to balance exploration and exploitation activities through a structural ambidexterity approach. In addition, senior leaders tried to develop an organizational culture or climate that encouraged organizational members to put intuitive ideas forward i.e. being open to new insights, tolerating certain levels of failures, and providing recognition for intuitive ideas. Most importantly, Hospital A's organizational leaders tolerated differences, and recognized and rewarded different perspectives, skills and knowledge that allowed diverse knowledge and ideas to prosper. Indeed, leaders at Hospital A encouraged their organizational members to express their ideas and inspired employees to be creative with their intuitive ideas or insights in the intuiting process. However, idea generation needed to be supported by an organizational culture whereby employees worked together through interaction and collaboration in the phase of interpreting. This stage is highlighted in the next section – a stage where individual members with intuitive ideas could begin to add finer details to their ideas in order to develop them into initiatives that could be understood by other members.

7.3.2   Interpreting

According to Berson et al. (2006), in the interpreting phase, leaders facilitate the group process of interpretation by refocusing the learning of organizational members on organizational objectives that may not be readily compatible with existing individual needs and interpretations. At Hospital A, senior leaders communicated the hospital's vision and *strategic* priorities to provide a source of shared interpretation that guided innovation activities within the organization. The hospital's vision is "growing with the community to provide excellent healthcare", while its strategic priorities were to provide healthcare services to both private and public patients as part of its public-private partnership arrangements. Using vision and strategic priorities, senior leaders at Hospital A directed innovation activities by highlighting the more important areas for innovation relevant to the achievement of the hospital's goals. This is evidenced by the following comment:

> *Strategically, we've made a decision that we're a private hospital running a public service. We need to make sure that we're not only taking care of the needs of [the parent company] around being a private hospital providing private care, but we also have to serve the public. We need to make sure that we are keeping up with the growth in the community, that we're doing everything we can to meet the minister's expectations and needs, because if we don't, our contract which we have with them, and which is seventy percent of our business in the hospital, is at risk.* (Manager 1)

While Hospital A had to increase efficiency to meet the government standards and targets, the hospital also had to differentiate its services between public and private patients to achieve competitive advantage. The hospital often had to pursue medical innovation by adopting new medical technology in order to provide excellent healthcare in the state. As such, Hospital A strived to pursue both cost-leadership (increasing efficiency to reduce costs or to prevent cost escalations) and differentiation (setting itself apart from the competition by offering new

technology-driven medical services) strategies simultaneously as suggested by Santos-Vijande et al. (2012). Senior leaders at Hospital A encouraged their organizational members to find novel solutions to realize these strategic priorities. Through the group process of dialogues and conversation, more precise and concrete intuitive ideas or insights to achieve the hospital's vision and strategic priorities were developed. As organization members collaborated and worked together, they developed cognitive understanding of the finer details of ideas and these concrete ideas that emerged would normally be supported by the leaders if they were in line with the hospital's strategic direction:

> *If you can demonstrate an area in need of a change and also what the perceived benefits will be, and then if you can follow it up with the actual results of that, then I'd be very confident that from the CEO down, you would have support for the change.* (Manager 2)

> *It's about communicating what it is you're doing, articulating what it is, what impact it will have on the organization, and as I said, they are very supportive.* (Manager 3)

Thus, in this interpreting phase, leaders at Hospital A used vision and strategic priorities mentioned above to help organizational members frame the contribution of their learning and align it with the hospital's goals. Although this practice sounds similar to the one that has been identified at the intuiting phase, the level of consideration is more interpersonal rather than within individuals. It is expected in this interpreting process that organizational members exchanged knowledge and intuitive ideas to collectively develop these ideas into more concrete initiatives.

To facilitate the collective interpreting process in the idea generation for innovation, leaders at Hospital A also used *structures* that enabled interaction and collaboration among organizational members from different organizational units or areas, for example:

> *Every Friday we have a meeting and all the team leaders get together and the chief executive talks and we all have an opportunity to present. It really is an open dialogue, we get a real good opportunity to see what is going on in each of our departments and to actually consult with one another and to advise one another about what we're doing. For example, I just made a presentation to team leaders and they comprise probably about ninety different people in this room at the same time, so one hour every Friday we go and we meet. It really is an excellent way to know who your counterparts because it's a big place.* (Manager 3)

> *Also there's a thing we have called Toolbox, where clinical managers all get together and they can discuss ideas there, and indeed, people bring problems to that area and as a whole team. That's when it gets discussed to see how we can overcome this problem or new ideas can be shared. And that's where the leaders from all of the different areas can bring back feedback from their areas so all levels of staff get a chance to have a voice.* (Manager 2)

It appears then that in practice in Hospital A, the intuiting and interpreting phases are closely intertwined. Where the intuiting phase was about eliciting ideas from individual staff at all

levels via a number of means, the interpreting phase was about coming together to share those ideas and interpret them in the light of the vision, strategic direction and the available resources such that some ideas crystallized to become more concrete.

In addition, the Community Board of Advice mentioned in Section 7.2.2 was also an avenue for collective engagement which provided enriched interpretations from multiple perspectives required for the development of intuitive ideas into something more concrete or that could be implemented.

Senior leaders at Hospital A also used formal procedures to foster common interpretations in regards to the importance of patient safety. This shared interpretation is important for example in the case of understanding risk identification. Employees offered their perspectives related to risks that could threaten the safety of patients. They were encouraged to identify such risks and hazards and shared these with other carers in the Hospital to continuously improve their service delivery standards. Risk identification could thus drive process improvements which in turn improved healthcare safety in Hospital A:

> *Risk – we monitor all our incidents, whether they be staff, patient-related or facility-related, so they would certainly drive change to innovate and make improvements.* (Director 1)

A certain degree of formalization can facilitate bottom-up exploration initiatives by reducing the information complexity associated with exploration activities as proposed by Wei et al. (2011). For instance, by having formalized risk identification procedures in Hospital A, organizational members at lower levels of management have a common frame of reference with which to interpret their ideas and have them better understood by their senior leaders. However, Wei et al. (2011) also found that high level of formalization can lead to exploitative innovation by narrowing the scope of bottom-up exploratory initiatives. While this may be true of other organizations, in an organization like a hospital where patients' lives are at risk, formalized procedures for certain things like risk identification are necessary. Due to safety concerns, Hospital A tended to have high formalization in adopting new medical innovation which often resulted in more incremental or exploitative medical innovations despite the adoption of new medical technology associated with exploratory medical innovation. Nevertheless, Hospital A strived to have more relaxed formalization around new non-medical initiatives that were not associated with patient risk (e.g. improved patient registrations and admissions) to encourage exploratory innovation:

> *Other aspects that are not clinical, there's less restrictions and there's less process around those things for good reason, because I suppose one of the things you like to see is a speedier process. So we don't want to put too much red tape and too many barriers in place for people to be given the opportunity to try.* (Manager 1)

As such, senior leaders strived to initiate new thinking and interpretations where organizational members were encouraged to pursue more innovations to improve the hospital's business processes and in turn increase its efficiency whilst considering the issues of patients' safety.

In the interpreting phase, senior leaders at Hospital A strived to foster interpretations of ideas within the context of process improvements and increased efficiency as required by the state government. One of the ways the senior leaders showed their commitment was by establishing the dedicated exploratory unit in the area of patient flow and clinical redesign and appointing new personnel to bring new insights and interpretations to improve processes in this area. Thus, intuitive ideas that staff may have were directed or channeled through a formal structure to address and implement process innovation.

In addition to structures, leaders at Hospital A tried to develop an organizational *culture* or climate that could promote knowledge exchange among organizational members to enable the generation of concrete ideas through a collective interpreting process. At Hospital A, leaders facilitated informal meetings among hospital members to enable them to meet and converse. As part of an attempt to create an ambidextrous culture as suggested by Wang and Rafiq (2014), leaders of Hospital A allowed organizational members to have different perspectives to encourage the generation of exploratory ideas. The Hospital had a collaborative climate and staff believed that the workplace had provided them with a social setting for idea discussions, for instance:

> *We have social functions with staff where there's a lot of interaction with all levels of staff, we have a huge Christmas party that we put on for the staff for nothing – it costs us money, it doesn't cost the individual anything.* (Director 1)

The lateral ties built by staff during these meetings provide them with the social support to help clarify or crystallize their ideas in the interpreting phase. Hospital A also cultivated teamwork by conducting the "Growing the Blue" program, as illustrated in the comment below:

> *They also have Growing the Blue [workshop] which is basically a process across the site of identifying how we can improve our culture, so it's really promoted from the ground up. So all the staff members here have access to these workshops and they go along and they meet colleagues from different areas and it is tremendous. I have to say I can't recommend it enough as being quite unique here and is a very, very positive thing.* (Manager 3)

Through this program, leaders tried to develop common language and shared interpretations which facilitated collaboration among hospital members in achieving the organization's goals. Being immersed in workshops with other hospital members from different areas, individual members in this program could be exposed to multiple perspectives or new knowledge. As such, they could be more open or even be able to use new knowledge outside their own functional domain which could further stimulate exploratory initiatives. The teamwork aspect also

provides the social support that will help them to crystallize and interpret their ideas further so that those ideas could be implemented. This supports the findings of Nelson et al. (2010) that social support in terms of the provision of relevant information related to innovation as well as emotional support that demonstrates concern and a willingness to listen are important for enabling an idea to progress from the initiation stage to the implementation stage of innovation.

Since Hospital A had finite organizational *resources*, the range of exploratory initiatives that could be pursued was limited. As such, senior leaders shared interpretations that organizational members needed to find innovative solutions within a constrained set of resources. Lettieri and Masella (2009) state that hospitals needed to pay attention to the coherence of the human and physical resources in the adoption of technology and this is no different in Hospital A, as the data below suggests:

> *We have to ensure that, particularly in health, that we have the right people from a clinical expertise point of view, so in other words, that we ensure that people have the tools for success in terms of innovation; that we have the right skill set.* (Director 2)

As previously mentioned in the intuiting phase, the medical practitioners' existing knowledge and skills influenced the adoption of new technology in Hospital A. Medical equipment suppliers provided insights to these medical practitioners in regards to the latest medical technology to improve healthcare services. When Hospital A did not have the required set of skills and knowledge to deliver medical innovations that were identified in the intuiting phase, they might cooperate with external innovation partners to realize these innovative initiatives with the approval from senior management (see Section 7.2.4).

While Hospital A had relatively cutting-edge medical technology, it needed to have significant improvement to its IT infrastructure for its operations as suggested by the interview respondents (see Section 7.2.3). Leidner et al. (2010) argue that the Chief Information Officer (CIO), strategic leadership and the top management team's (TMT) attitude toward IT are key drivers for IT innovation in hospitals. Nevertheless, it appeared not to be the case in Hospital A. Although both IT manager and hospital executives at Hospital A shared a common interpretation about the need for better IT systems, the hospital faced significant challenges to convince its parent company to get additional staff to improve the hospital's IT systems:

> *Well clearly when you introduce something, for example, you're introducing a new business process and as a result of that new business process you need to have more staff to actually do that. Of course that's a problem for us, because you cannot have more staff than your ratio allows you to have based on the number of patients in the hospital... The negotiation [to the parent company] to get additional staff is extremely difficult.* (Manager 3)

This supports the findings of Lambooij and Hummel (2013) that the benefits and costs of innovation could affect the views of various hospital stakeholder groups of the importance of

innovation initiatives. In addition, the limited budget tended to discourage the adoption of new exploratory IT infrastructures. As a result, in terms of IT, Hospital A needed to catch up with the other hospitals in the state:

> *From an IT perspective, we are very, very poor in comparison to other hospitals. So I can compare myself to [other hospitals], equitable size, and know that we have not got some of the supporting IT infrastructure that we need in order to perform our tasks properly.* (Manager 3)

Overall, senior leaders consistently used vision and strategic priorities to set interpretations of its organizational learning and this was communicated to all organizational members. While the interpreting process was guided by senior leaders, facilitating collective interpretation was achieved persuasively involving a relatively more bottom-up approach through programs like "Growing the Blue". Senior leaders facilitated dialogues and conversation among organization members to encourage collaboration through both structural arrangements and organizational cultural approaches. For example, Hospital A had formal cross-functional meetings that enabled organizational members to explore intuitive ideas from multiple perspectives. It also had a Christmas party that allowed organizational members to socialize and get to know each other better. This could enhance communication for collective interpreting and promote collaboration within the hospital. As previously mentioned in the intuiting phase, ideas might come from individuals like the CEO. However, ideas could also result from discussion or collective interpreting among the hospital members. As such, intuiting and interpreting phases often could not be demarcated clearly in the process of intuitive idea generation. In the intuiting and interpreting phases, organizational members at Hospital A respected and rewarded different views, skills and knowledge and this could enable diversified intuitive initiatives within the hospital to flourish. This condition could allow exploration of new knowledge in Hospital A. However, organizational members needed to integrate different views in the integrating phase otherwise they would fail to exploit the knowledge learned and realize the intuitive initiatives. Crossan et al., (1999) are of the opinion that there are a number of challenges in the movement from interpretation to integration (feed-forward) in organizational learning.

7.3.3   Integrating

In the phase of integrating, leaders need to provide a shared understanding and common purpose required to integrate learning at group and organizational level (Berson, et al., 2006). At Hospital A, organizational members at different healthcare units in this hospital often perceived the importance of innovation initiatives differently resulting in competition for scarce resources:

> *I suppose budgetary tensions would be there because it's often a fine line. You have a certain dollar amount and there could be various different projects that need input, so*

therefore it's often quite difficult. You're often challenging other people on the same level and saying "My project is equally as valid as your project," so it's trying to get your project over the line. But generally it's looked upon as well "What's going to give the most benefit to the most amount of people?" Often they're the tensions – looking for budget. (Manager 2)

As such, leaders at Hospital A had to prioritize these innovation initiatives based on the fit of these initiatives with the hospital's *strategic* priorities, as illustrated in the following comment:

The decisions that we make, really, we try and align them to the overall strategic plan. And we'd always try and stay true to that strategic plan. (Director 2)

You like to hope that we buy stuff that's in line with our strategy, or make change in line with our strategy. (Director 1)

Due to its public-private partnership arrangement, Hospital A also had to align its strategy with the state government's strategic agenda although the hospital also strived to differentiate its services between private and public patients. Such strategic alignment is critical as it guides the prioritization of innovation initiatives during the integration phase:

Some, I suppose, balancing the business with what may be coming from the Department of Health as well, so we have to prioritize. Prioritizing is a big one in health because there are lots of priorities. (Director 2)

In addition, with high quality healthcare for patients being the focus of innovation in Hospital A, it is important for the organization to continuously ensure that such consistency in the implementation of service delivery is maintained in the integrating phase of organizational learning for innovation:

And that's obviously the number one goal for everything – Is that going to have some benefits for our patients? (Manager 2)

As previously mentioned in the intuiting and interpreting phases, leaders used the hospital's vision and strategic priorities to inspire their organizational members to develop novel solutions. In the earlier intuiting and interpreting phases, leaders' emphasis was on stimulating divergence of knowledge that could lead to diversified initiatives. In the integrating phase, leaders used the vision and strategic priorities to integrate individuals' knowledge to achieve a common understanding through which the hospital members would collaborate to achieve the hospital's ultimate goals. As such, in the integrating phase leaders strived to pursue the coherence of knowledge by developing common language and shared mental models through the hospital's vision and strategic priorities to facilitate coordination and integration. The integrating phase is different from the interpreting phase where an individual's ideas are interpreted through various lenses (including vision, strategy and social support) in order to become crystallized as something that could be implemented in the context of Hospital A. It is in the integration stage where a shared understanding is achieved about the costs and benefits of initiatives and which

initiates take precedence over others in terms of their implementation (or in terms of the integration of organizational learning).

The integration of interpretations was required at many levels of the organization. At the top most level was the integration between the interpretations of Hospital A's senior leaders and its parent company as well as the integration with the state government's agenda. Differences in interpretations by these parties are essentially based on differing visions of the future and decisions around resource allocation. At this level, the CEO took an active role in negotiating the higher-level strategic plans of Hospital A with its parent company and the state government in an effort to integrate visions:

> *The CEO, does all the negotiating with the Department of Health and with [the parent company] and there's ongoing discussions and negotiations happening all the time about all those things [external challenges]. Then we talk about them in our executive meetings to see what opportunities we can perhaps grab hold of and take advantage of.* (Director 1)

At the next management level, senior leaders integrated their views and developed strategic priorities for guiding innovation activities in Hospital A. Between the senior leaders and the organizational members, integration was focused on obtaining acceptance of senior management's decisions. The senior leaders had to communicate the reason for strategic changes. If the changes were imposed by the government such as regulations, there was least resistance to the changes:

> *But if it's at a national level, quite often it will be escalated, so like a chief executive will say "If this is really high on my priorities, it will become something that's mandatory," so for the organization we must do this. But generally when it gets to that stage there's not a lot of resistance.* (Manager 2)

Through continuing and active conversations, organizational members identified areas of difference and agreement to achieve shared understanding for the pursuit of innovation in the integrating phase.

In the integrating phase, *structures* could provide opportunities for organizational members at Hospital A to have formal interactions that enabled dialogues and conversations. In this stage, continuing and active conversations were aimed at achieving a common understanding and to resolve conflicts (Crossan, et al., 1999). As mentioned earlier, senior leaders conducted executive meetings regularly to discuss strategic issues. The regular meetings among senior leaders facilitated discussions and debates around conflicting demands and goals associated with exploration and exploitation activities. Jansen et al. (2009) argue that senior team social integration can facilitate the integration of exploration and exploitation across the organization. The senior management made decisions around resource allocation for both exploration and exploitation in Hospital A. If new initiatives involved significant changes to the existing

strategic direction and high costs, the initiatives needed to be approved by the senior management team. Based on their knowledge and understanding of Hospital A's external and internal contexts, senior leaders would then select the most feasible initiatives that could potentially meet these challenges.

As previously mentioned in the intuiting and interpreting phases, Hospital A had various formal cross-functional meetings that facilitated collective interpreting for the development of intuitive ideas. In the integrating phase, these formal cross-functional meetings enabled dialogues and rational discussions to resolve conflicts and achieve shared understanding. In these meetings, hospital members could consult with other members from other functional areas to identify inter-dependencies, constraints, and opportunities for collaboration between functions to promote integration. In addition, for undertaking particular innovation projects, Hospital A also formed cross-functional teams that assisted in the integration process. The members of cross – functional team could move back and forth between their functional areas and the projects allowing them to transfer and exchange knowledge between the functional areas and the projects. This could enhance coordination among relevant functional areas in the implementation of new initiatives.

Hospital A also strived to enhance collaboration among specialists to cope with emerging cohorts of patients whose needs were difficult to meet using the traditional hospital structures, such as ultra-elderly frail patients. Hospital A had the Rehabilitation and Acute Aged Care Medicine unit which was coordinated by the Multi-Disciplinary Team comprising doctors, nurses and allied health professionals (physiotherapists, occupational therapists, speech pathologists, dieticians, and social workers). This is in line with the idea of Lega et al. (2012) that the modern hospital is required to design its organizational structure based on the changing intensity of care needed by the emerging clusters of patients. As such, Hospital A created teamwork among specialists to work together to provide better healthcare for elderly patients. Lin et al. (2017) argue that teamwork provides opportunities for organizational members to have conversation and collaboration which facilitate integration.

In addition, Hospital A had formal procedures to prioritize the most reasonable and feasible initiatives in order to resolve tension or conflicts among different individuals and/or groups due to competition for funding. Leaders evaluated and selected innovative initiatives against particular criteria that could best deal with the actualization of the organization's objectives and the criteria helped in the integration of different perspectives to gain a common understanding of how ideas could best benefit the organization. The criteria included potential benefits, costs, required resources, and risks:

> *Generally questions will be asked "What are the perceived benefits?", "What will the cost be?" to implement any new innovation. "What will the risks be?" and "Will there*

be any benefit to the patient?"... So really, it's probably set against those criteria as to when it goes forward. (Manager 2)

But when it comes directly to innovation, I think generally speaking it's looking at the trade-off between what's the perceived cost of the innovation and the return that you would get from making the change. (Manager 1)

The criteria that helped in integrating different perspectives about how ideas could best benefit Hospital A also included compliance with the state government's regulations and standards:

Obviously we need to meet certain standards. If we know there's an area that needs to be boosted in order for us to meet the standards, this will often get the first pick from the resources. (Manager 2)

Lettieri and Masella (2009) propose that hospitals must assess the adoption of emerging technology against the coherence with the legal framework and with the generally accepted ethics. In addition, the general resource allocation processes were mostly directed towards projects that could offer the most benefits for Hospital A:

We look at what can be funded and what can't be funded, and what's going to have the biggest impact. What's going to bring about the biggest amount of change will often be a decider as to whether the resource gets allocated. And similarly, what that is actually going to bring in regard to what the hospital can actually offer. (Manager 2)

To specifically deal with the evaluation of new health technologies, Hospital A had a "Product Evaluation Committee" which had an important role in the pursuit of medical innovation:

It's heavily governed with our Product Evaluation Committee. So in regard to medical equipment, we would feel that we're fairly state-of-the-art. But there is a process and of course it is governed by resources, but again, if people can demonstrate that it is going to make a difference to patients, then we'll always trial it. (Manager of Patient Flow & Clinical Redesign)

In this way, different perspectives about the importance of new initiatives could be integrated and conflicts could be minimized. Thus the evidence form Hospital A indicates that in the integrating phase, some formal mechanisms in the form of structures were also used to bring about a common understanding about innovative ideas to integrate any learning or knowledge around those ideas.

In addition to the above structures and formalization, Hospital A strived to develop an organizational *culture* or climate that promoted integration. Hospital A adopted the "One Team, One Direction" approach to promote integration of thinking and behaviors required for implementing changes. The approach was initially prepared for the redevelopment program which started in 2009. This is supported by the comment below:

"One Team, One Direction" is our preferred culture. We have identified, going back to two thousand and nine, the kind of culture that we would prefer to have here. We need

everyone to know their bit and then come together to share what they know to make sure the place runs really well. (Manager 1)

Hospital A also shared the values of the hospital's parent company which influenced its organizational culture and encompassed how the hospital wanted to work. These corporate values became the organizational culture that promoted and nurtured collaborative behaviors in achieving the organization's goals and this could promote integration at Hospital A:

> *We've got a real positive culture. We try to encourage the humanistic, encouraging, affiliative aspects and traits of individuals, and we do collaborate and promote the nurturing and supportive side within each other and especially with my girls and my team. That's our job – to be approachable to people and to expect that back, but the conditions in our organization do promote that kind of behavior. It's just the accepted norm, so it's good conditions.* (Manager 4)

When conflicts arose due to mostly resource competition, leaders at Hospital A facilitated dialogues and rational discussions between conflicting individuals and/or groups to promote a common understanding and integration:

> *We've also used the services of an organizational development group to basically work on culture within the hospital, and so if there's conflict within a team for example, we take them away for a day and work through issues so that there's clarity about what the conflict is about and then put in steps to resolve it.* (Director 1)

Leaders also used both formal and informal meetings which were similar to ones in the intuiting and interpreting phases to facilitate dialogues and conversations among the hospital members. Through such meetings, leaders created an organizational culture or climate that encouraged diversified knowledge to stimulate varieties of intuitive ideas in the intuiting and interpreting phases. However, in the integrating stage, leaders used such meetings to promote knowledge coherence or the acceptance of new initiatives in order to integrate ideas for implementation. Meetings to integrate ideas are mainly focused on resource allocation between competing ideas and the acceptance of the chosen initiatives by all organizational members to be implemented organization-wide.

The integration process was most difficult in terms of *resource* allocation that required a trade-off. Hospital A's leaders had to prioritize initiatives that potentially offered sustainable profits through the provision of high quality health services. While Hospital A had strived to adopt a more bottom-up approach to balance the budgeting process, the hospital tended to have a top-down process due to the complexity of its budget structures:

> *Our budget's negotiated with our national office so they have an expectation of what revenue we're going to bring in, and we do involve the departments, but not extensively. We probably guide them more than allow them to build the budget from the bottom up. Our budget's very complicated because of the public and private contract components.* (Director 1)

Due to limited resources, the hospital prioritized initiatives that could potentially offer greater return with minimum costs. As mentioned above, Hospital A prioritized initiatives related to meeting the government's compliance and standards which mostly required increased efficiency. However, despite the resource-constrained climate faced by Hospital A, it could still pursue the redevelopment initiatives because of the funding from both the state government and its parent company as part of the previous contractual agreements between Hospital A and these parties. The completion of most of the redevelopment project in 2013 involving the development of new medical services and the pursuit of medical innovation suggests that post redevelopment, Hospital A strived to achieve increased operational efficiency that could be associated with exploitation:

> *We've got the facility, our challenge now is to deliver operational effectiveness, so that's about speed, it's about efficiency, it's about looking at quality and continuous improvement on an ongoing basis. It's about making sure we continue to be profitable. So it's from a growth phase to an operational phase, and that's the transition.* (Manager 1)

This is an example of Hospital A's endeavor to achieve balance between exploration and exploitation activities through a sequential approach to ambidexterity i.e. exploration in the form of new services during the redevelopment period and exploitation in the form of process improvement for efficiency after the redevelopment. Since 2013, leaders at Hospital A have been more focused on increasing efficiency and maintaining a competitive cost structure for its service delivery. Even though Hospital A upgraded various facilities for patient satisfaction, its cost leadership structure is in line with the need for meeting the government's standards for increased efficiency for public service provision. With around seventy per cent of public patients at Hospital A, it was a required necessity for Hospital A to meet the government's expectations as required in the public contract. Leaders at Hospital A communicated the reason behind this prioritization to achieve shared understanding. The dialogues and conversational processes in the integrating process allowed organizational members to integrate their ideas and negotiate mutual adjustments to their actions as suggested by Crossan et al. (1999). As a part of the mutual adjustments, due to limited resources the hospital members tended to pursue IT-enabled innovation in an exploitative manner using available resources to increase efficiency despite the need for more advanced IT infrastructures:

> *So despite the fact we haven't got a particularly good IT system, it's not very robust, what we did do when I joined is I recognized that there really were some very simple things that we could implement with the existing applications that were available to us that would actually facilitate this department.* (Manager 3)

Although research has found that the adoption of healthcare information systems may lead to increased efficiency (K. Lee, Wan, & Kwon, 2013), Hospital A has not been able to take advantage of this opportunity. The limited resources and the parent company's policy appeared

to impede the pursuit of exploratory IT-enabled innovation. This is confirmed by the following comment:

> *Within this hospital for example, we have just recently recruited someone as a solution architect to look at our IT requirements, but because it's managed corporately we are often foisted off with an application that really doesn't meet our needs at all – not at all.* (Manager 3)

In general, Hospital A had a relatively high level of integration around operational issues but some degrees of diversity around strategic issues, particularly in the use of IT to support its business processes. For example, leaders of Hospital A had not been able to convince its parent company about the strategic importance of the adoption of new IT infrastructure. Leaders used the hospital's vision and strategic priorities to integrate intuitive ideas and encourage organizational members to work collectively to achieve the organization's goals. Leaders used structures and formal procedures to create an organizational context that promoted integration through dialogues and conversations among the hospital members. For example, the hospital had formal meetings at the senior management level and formal cross-functional meetings at the lower levels of management. The organizational context also included an organizational culture or climate that encouraged integration by stimulating knowledge coherence and collaborative behaviors. For instance, Hospital A adopted a "One Team, One Direction" approach to encourage organizational members to work together to achieve a common goal. The most difficult integration process was in resource allocation that required a trade-off. Although Hospital A had strived to balance top-down and bottom-up approaches in its budgeting process, in practice it used more top-down approaches due to the complexity of its budget structures. With around seventy per cent of its patients being public patients, Hospital A focused on a cost-leadership strategy and increased efficiency to meet the public contract. Through two-way communications involving bottom-up and top-down knowledge inflows, leaders at Hospital A could facilitate coordination and integration despite the budgetary tension. The relatively high degree of integration allowed leaders at Hospital A to institutionalize changes in the next phase of 4I organizational learning.

7.3.4 Institutionalizing

In the institutionalizing phase, leaders at Hospital A played a significant role to make knowledge available for exploitation, which included the implementation of new changes in strategy, structures, procedures, systems, and infrastructures. Lin et al. (2017) argue that leaders should institutionalize knowledge in a such way that enables an organization to create an organizational culture which is conducive for innovation and to develop an organizational capability in configuring and reconfiguring resources and operational routines to respond to

changing environment. As such, institutionalized knowledge will enable organizations to both explore new knowledge and exploit existing knowledge simultaneously (Lengnick-Hall & Inocencio-Gray, 2013)

Senior leaders at Hospital A incorporated new knowledge into the hospital's high-level *strategy* in the institutionalizing phase. This strategy was expected to provide some level of direction to organization members to pursue innovation but should not be too explicit so as to limit the freedom to find novel routes to achieve the organization's goals as suggested by Hunter and Cushenbery (2011):

> *Our strategy tends to ebb and flow. It needs to be broad enough to be able to adapt to any changes – if we've got to turn around and change direction because all of a sudden we need to build a hundred-bed mental health unit down the back, then our focus is going to be on getting that up and running. Therefore it's going to be off something else and we just adapt; we need to do that if we need to it and we do.* (Director 1)

While the strategy between 2009 and 2013 was to pursue redevelopment initiatives, the existing strategy has shifted to achieve operational efficiency through mostly exploitation activities to enable the hospital to gain financial benefits from its new facilities. Thus the strategy of focusing on efficiency and cost effectiveness is used as a mechanism to embed or institutionalize knowledge into the operations of the organization i.e. knowledge focused around improving operational efficiency or saving costs. However, it does not mean that Hospital A has neglected its exploration initiatives (such as the introduction of new medical innovation) but rather it has put more emphasis on efficiency than on differentiation. This would enable Hospital A to build strategic flexibility as suggested by Santos-Vijande et al. (2012). The renewed strategy provided a new source of interpretation for the hospital members to frame their ideas and find ways to achieve the organization's strategic objectives, as illustrated in the following comment:

> *Our intention is to roll it out department by department and then get them to dovetail what their strategy is for their department, dovetailed into the organisational one so it all feeds up, cascades up and down.* (Director 1)

Some innovation initiatives related to the implementation of the renewed strategy were already undertaken but other initiatives were about to be started. This means that some innovation initiatives were already in the phase of institutionalizing but other initiatives were still in the phases of intuiting and interpreting or in the stage of integrating. This illustrates the dynamic nature of the 4I process that Crossan et al (1999) envisage.

In some instances, the evaluation of the success of innovation initiatives could trigger new intuiting to come up with new ways of doing things and lead to feed-forward learning. When the results or performance of an innovation strategy were not as planned, leaders at Hospital A would revise the implementation plan. It could potentially loop back to the initiation phase of

innovation where new ideas are generated in the intuiting and interpreting phases, followed by the selection process in the integrating phase, and ended by the modification or even renewal of previous innovation strategy in the institutionalizing phase. This is supported by the following response:

> *So with any sessions that we run we have evaluation forms, with any workshops we always have written forms for evaluation. Other methods of measuring outcomes or success are in response to clinical incidents, we can measure them before and we can measure them after innovation has taken place when hopefully it's calmed down. Patient satisfaction, staff satisfaction and then feedback; feedback as to whether it is a good innovation. You know, "It's not quite there yet, let's go back and revisit and tweak it again." So lots of different forms of feedback to assess whether it was a worthwhile investment.* (Manager 4)

Conversely, when the performance of an innovation initiative showed positive results, the proven success could promote exploitation of the existing innovation strategy and lead to further feed-back learning. Although organizations can rely on exploitation of past knowledge for some time, they cannot rely on it forever as they may fall into a "success trap" and eventually their competences become obsolete (March, 1991). As such, leaders at Hospital A had to balance tension between exploitation and exploration by being able to exploit existing proven strategy and explore new promising innovation strategy. Grafton et al. (2010) propose that organizations need to include performance measures to direct managers' attention to the longer-term consequences of their strategic actions to stimulate the pursuit of exploratory innovation.

Leaders at Hospital A made decisions around resource allocation, structure, measures and targets (relevant KPIs), and schedules for implementing innovation initiatives in relation to the renewed strategy across different levels of management. Hospital A used external reference points to analyze its own performance, outputs, and processes when possible, for example the use of NEAT as a benchmark:

> *Well, for my team we're heavily governed by NEAT which is the National Emergency Access Target. Within that there are various different KPIs that we would have. For the whole country the target for this year is eighty five percent, so obviously that's our target as a hospital, but within that we would have different targets for different areas.* (Manager 2)

With the relative availability of the state government's reports of performance indicators for public hospitals across the state, Hospital A could use this information to benchmark its performance against the regional average performance level. As such, Hospital A could set attainable targets which could yet be difficult to achieve in order to motivate individuals and groups to perform better such that the formal institutionalized system for learning could be challenged or modified to promote new learning. Thus, the targets would provide the new context for interpretation and in turn would stimulate intuition. This is one example of what

Crossan et al. (1999) refer to as the iterative nature of the 4I process. Hospital A's leaders included these targets as KPIs to evaluate the success of innovation initiatives, for example:

> *For our KPIs as well for our own team, for example with the Bed Management Team, getting patients from the ED into an admitted ward, that is something that we're working on and we have our own KPI for that.* (Manager 2)

In the institutionalizing phase, leaders at Hospital A used *structural* arrangements to implement innovation strategy. The hospital had a relatively flat structure without many layers for approvals and budgeting, facilitating both bottom-up and top-down knowledge inflows and enabling coordination for institutionalizing changes. This is supported by the comment below:

> *So because we're lean, we don't have a big bureaucracy that has to be consulted. We can actually make decisions and affect change very quickly, because we can. One minute we decide we're going to start a new procedure and within a matter of months we can have it up and running, so we do it quickly.* (Director 1)

However, as Hospital A grew bigger, communication became more challenging in that the hospital had to use various means of communication to feed-back institutionalized knowledge to all organizational members:

> *The bigger you get the harder it is to get that communication flowing up and down so that it touches everybody. We have a lot of publications, we have emails, one-minute updates that come out every week – there's a lot of communication that happens.* (Director 1)

> *We had something called the One Minute Update which was a means of getting a brief one-pager once a week out to all staff to say this is what's happening. But not every staff member has a PC at their desk, they're working on wards, they're working in back-of-house areas, catering and kitchens. So we then said "Everyone gets paid every fortnight" and so we went on a big drive, a big campaign to get everyone to have, rather than paper timesheets and pay slips, to get their pay slips emailed to them at home.* (Manager 1)

Leaders at Hospital A provided regular updates and also encouraged open dialogues with staff regarding the redevelopment process and other changes related to innovation. They also provided all information about existing policies and their owners so that organizational members could consult with the relevant person or areas regarding particular policies. Information provided by senior management in company-wide meetings and the formation of formal cross-functional teams in various phases of learning process enabled organizational members to learn and adopt newly institutionalized practices. In this way, leaders at Hospital A tried to ensure that new changes such as new routines for bed management were communicated and new knowledge became accessible for all organization members to exploit. This would enable feed-back learning at Hospital A in which institutionalized knowledge at the organizational level was fed-back to the group and individual level.

Leaders at Hospital A also supported the institutionalizing process via coordination processes, such as standardized routines. For example, once the procedures in the new bed management system were implemented and institutionalized in existing routines in Hospital A, the hospital members had to undertake their jobs according to this new routine and eventually this became the practice in Hospital A. The improved bed management system in the hospital has significantly reduced the average time from patient needing a bed to notification of the allocated bed. Such practice will last for some time until new problems arise, new regulations are imposed, or the expected average time increases. Then, the hospital needs to review the system again and this usually triggers new intuiting to change the routines. As previously mentioned in the intuiting phase, Hospital A had a formal policy review to question established routines and this would help the hospital keep its standardized routines relevant.

Hospital A also had standardized routines to deviate from the established routines when situations called for them. Although the decentralization of decision making to the local level was required to enable leaders at lower levels of management to respond to external changes quickly, formalized routines and procedures as part of the institutionalization process were still required to ensure the patients' safety. This is confirmed by the comment below:

> *They're meant to say that this is the policy and procedure, so faced with these situations, this is what we recommend you do and this is how we recommend you do it. There will always be variations to that. It's impossible to think of all the situations and document them, and even remember them, or even know that they're there. So people are able to really use them as a guideline. There are certain areas where that are more important, particularly around clinical practices, but in the organisation we say "use this as a guide." It's very much about what we see as being appropriate. And normally we'll say if there's something you need to do, if you need to deviate from that, well then here's the process for doing that.* (Manager 1)

Wagner et al. (2014) argue that the decentralization of decision making to the local level can support quality improvement in hospitals but some level of formal guidance to help structure the available options is required to support decision making at the local level. As such, decentralization complemented with some level of formalized routines or procedures could empower hospital members to make necessary adjustments in the institutionalization process.

In addition, as part of the redevelopment initiatives, Hospital A often had to introduce new standardized routines for new medical services and the hospital had a dedicated unit for training and development to institutionalize new routines. Lettieri and Masella (2009) argue that the successful adoption of new technology in hospitals requires adequate training to put the new technology into routine operations. The provision of training was a part of the change management practices in Hospital A to ensure successful implementation of technological-based innovation.

During the implementation and institutionalization of new innovation initiatives, there could be resistance to change, and leaders in Hospital A provided support to organization members to go through the changes:

> *If someone is resistant to change, it's finding out what the issue is with it. Do they feel it's something that can't be achieved? If they feel that, finding out why not. Again, is it a resource issue. Do they think "I have to do this, this and this in the new process but I don't have the time to do it," so it's maybe looking back at what they're currently doing to see if there are any efficiencies that can be gained, so they then do have the time to do the new process. Or seeing if they need some additional assistance, additional resources, and really finding a way of how we can go forward with whatever it is that we want to do. And depending on the level of the project, if it's just a unit project, it may take a bit more time. You will have more time to kind of coax people along.* (Manager 2)

As communication was the key for achieving mutual understanding, in the institutionalizing process leaders at Hospital A developed two-way communications with organizational members to identify unforeseeable problems or barriers for implementation and worked collectively to solve these problems:

> *So it's really looking at what level of support and making sure that there's a feedback loop, that as problems arise they can be addressed at the time.* (Manager 2)

As such, leaders at Hospital A facilitated collective interpreting to provide insights for developing solutions to problems and integrating individuals' knowledge to achieve a common understanding. This shared understanding would then enable coordinated actions to further institutionalize new innovation initiatives.

The commitment and support from executives was also required to engage Hospital A's members in participating in the institutionalizing process:

> *Despite the fact that at the end of that process you are going to benefit the hospital, somebody is impacted along the way, and nobody likes being given more work to do and really, that's what it boils down to... we have to go back up to Executives, to the very highest, to have him come and talk to these people to try and engage them and get them to do it… You're always negotiating and we have to provide justification. Once we do that, most people are fairly agreeable and will come round to our way of thinking.* (Manager 3)

This supports the findings of Wong (2013) that top management's leadership and endorsement can minimize the inertia in the human capital and administrative systems that hamper innovation.

In addition, senior leaders should provide the necessary resources in the implementation and institutionalization of new innovation initiatives as it may require additional *resources*. For example, Hospital A may need to adopt new IT infrastructures to implement IT-enabled

innovation to improve its business processes. The hospital needs to invest in IT infrastructures that could provide flexibility to meet future IT needs:

> *I think we have to implement, we have to invest in our IT and implement ones that are going to work. And also not in a stop-gap type measure, look at trying to make it as future-proof as possible.* (Manager 2)

In a similar vein, the hospital also considered the technology life-cycle and technological coherence in adopting new medical technology so that the new technology did not become rapidly obsolete and the new and existing technology were compatible as suggested by Lettieri and Masella (2009). Thus it was important in Hospital A that the process of institutionalizing new knowledge through new systems or technology had to consider future technology needs and compatibility with existing technology infrastructure.

In other instances, in order to institutionalize new procedures or routines, the training and development unit is tasked to deliver relevant training and this unit tried to collaborate with other departments within the hospital to meet this need through resource sharing:

> *We usually try and develop the skills in-house, internally, so we collaborate within sites hugely and look for the right necessary skills, because the skills don't always necessarily come out of this department. It's my job to source it and implement it and evaluate it. So we collaborate hugely with the other departments and other staff within the hospital to make sure we can deliver the need that has been identified.* (Manager 4)

However, this unit would collaborate with external partners to deliver the required training when they did not have the resources internally:

> *I suppose if we opened up a new department or a new surgical procedure or medical procedure that we weren't familiar with as a site, then we'd have to adapt to that and we'd have to learn probably externally. We might have to get an expert person in the field in to come and speak and deliver and train us, so then we can cascade that training down. So we will quite happily outsource for relevant information or education if we don't have it identified within.* (Manager 4)

As such, by collaborating with external partners, Hospital A would be able to institutionalize new competences linked to the adoption of new practices or exploration activities.

Hospital A's senior leaders strived to manage and adjust the internal context discussed in the preceding sections such as strategy, structure, and resources allocation to institutionalize an organizational *culture* that was conducive for innovation. These leaders consistently communicated a clear message to organizational members that innovation is wanted and supported in Hospital A:

> *I think it's about engaging with our staff and that's why we want to do these public forums, to let them know that from the top, we're actually really interested in what they have to say and what they see, and how they see things can be done differently. Because I'm sure that they know, it's just that they probably don't feel that they have the voice to*

speak up. So it's about identifying and tapping into that resource, that would be good. (Director 1)

Hospital A even monitored its organizational culture to ensure that it had a supportive culture to undertake changes:

> *We do a culture survey every two years. We just remeasured the culture survey at the end of two thousand and thirteen, and one of the things that we measure in the culture survey is adaptability of the organisation to its environment. And according to the staff who completed it, they believe that we have become more adaptable as an organisation than we were back in two thousand and eleven when we last measured. So I know that we're more adaptable, and we do that by really trying to create an environment or a culture in the place that allows people to do their best work. And we do that by helping people understand what the goals are and what matters. We ask people to contribute in a way that allows them to be proud of their contributions. We've asked people to support the growth and development of other people and to do that in a way that builds relationships.* (Manager 1)

Senior leaders' commitment to innovation was not only demonstrated by the language they used to communicate but also from the support and resources they provided. For example, as previously mentioned in the intuiting phase, organizational members were given some level of autonomy to make changes or to innovate in the area they were in charge of:

> *Comparing it to other hospitals that I've worked in, they have a very, very good culture [here]. They really do promote their team leaders and empower them to feel that they can implement change, with consultation clearly, but it does empower them to actually improve things within their departments. So you're given the freedom to actually do that.* (Manager 3)

These leaders also nurtured knowledge sharing and collaborative behaviors by facilitating both formal and informal meetings among the hospital members during the institutionalizing phase. Not only did meetings facilitate the process of intuiting, interpreting and integrating phases, such meetings were also useful in the institutionalization phase. For instance, the hospital had a central staff dining room where employees could interact and converse informally. The hospital members could also find written information on notice boards in this dining room that served as a means of communicating the hospital's current activities:

> *The staff dining room is a great place for that and interestingly enough, we recognized that back in two thousand and nine and put up something called the Hub. So, we communicated to the hospital that this is a centre for sharing information, particularly written information with certain notice boards of things, a lot to do with the redevelopment, progress updates, what's happening and when and where. And if things were going to change, other kinds of events in the hospital, important information for staff, unions, whatever it might be, there was a place to go.* (Manager 1)

However, as the hospital was getting bigger and people were scattered in different buildings, it became difficult for them to go to this dining room:

> *The bigger you get, the more difficult it becomes. The other thing that would impede obviously is we're spread out. We've got people over here, people over there, people all*

212

over the shop, so you don't necessarily get to see them to the same extent that you would if we were all under the one roof. (Director 1)

Riege (2005) argues that the physical work environment can impede knowledge sharing. Hospital A tried to minimize the problem of the physical work environment by using TVs instead of notice boards to broadcast new information and by providing several common places where hospital members could still interact.

In order to support an organizational culture where change could be accepted and institutionalized, leaders at Hospital A also fostered a climate of recognition among the hospital members where they could recognize other members' achievements, share success stories, and celebrate team achievements:

> *And really it is about congratulating the people that are doing it well and making sure that they know that they're doing a good job, and letting everybody know how they can influence the change and where.* (Manager 2)

> *It's about getting them to see the positivity, the positive benefits to that change, and making them feel that they are involved and contribute, and revisiting back to the steps and seeing what we can work together on so that you can see the benefits, or can we modify it* (Manager 4)

As such, these leaders tried to encourage their members to innovate more in the future and ultimately institutionalize an innovation supportive culture.

In addition, Wang and Rafiq (2014) argue that in order to have an innovation supportive culture, organizations need to allow diversified perspectives among their organizational members to encourage creativity but these organizational members also need to have common perspectives in terms of the overall organization vision and direction. As previously mentioned in the intuiting and interpreting phases, at Hospital A, leaders allowed their organizational members to have different views and encouraged varieties of ideas. However, in the integrating and institutionalizing phases, these leaders strived to integrate different views to achieve a common understanding and encouraged their members to work collectively to attain the organization's goals. This is evident in the following comment:

> *I just can't stress enough the importance of people and culture in innovation. I think if there's one thing I've learned in my career to date it's that we as senior managers and executive are only as successful as the people we have working with us. So if we're not listening to everybody that works out on the wards or in the kitchens or in the laundry, wherever it might be, we're not going to be completely successful, because whilst we might have ideas, we need to trial the ideas and if we don't have people on board, well then we won't be successful, and we need the feedback.* (Director 2)

By having an organizational culture that allowed unity in diversity, Hospital A strived to encourage its members to explore new knowledge and exploit existing knowledge simultaneously. As such, Hospital A tried to balance the tension between exploration of new

knowledge and exploitation of existing knowledge through the creation of an ambidextrous culture in attempt to achieve a contextual ambidexterity as suggested by Wang and Rafiq (2014).

In general, the institutionalizing process at Hospital A was enabled by the hospital's organizational culture that fostered collaborative behaviors among its organizational members in achieving the organization's goals. Two-way communication involving bottom-up and top-down knowledge inflows at the hospital was the key for achieving mutual understanding to resolve conflicts and integrate differences which were required to make coherent and collective actions to institutionalize new knowledge. Leaders communicated the renewed strategy to provide the source of reinterpretation of innovation activities. Leaders also decentralized some decision-making processes at local levels to enable organizational members to respond quickly but still provided some degree of formalized routines or procedures to guide the available options for decision-making to ensure patients' safety. As other organizations in the previous cases, Hospital A also strived to achieve flexibility in its technological investments wanting have technological infrastructures that enabled it to meet existing and future business requirements. However, as previously mentioned in the integrating phase, it still struggled to invest in the required IT infrastructures mainly due to limited resources. In the resource-constrained environment setting, IT projects may not be able to compete with other medical-based treatment initiatives that could potentially have direct influences on the patients' health status.

7.4 Chapter summary

Hospital A had a relatively high rate of innovation but most innovations were process or exploitative innovations aimed at improving cost-effectiveness and operational efficiency. With the completion of most redevelopment initiatives in 2013, the hospital started to shift its strategy from differentiation (exploration) to achieve increased efficiency (exploitation). However, it did not mean that the hospital ceased its endeavors to pursue exploration activities completely. Some exploratory innovations included medical innovations which resulted from the redevelopment programs at Hospital A. This indicates that overall Hospital A's focus was weighted more towards a cost-leadership strategy and higher efficiency after the completion of most of its redevelopment projects rather than on a differentiation strategy. As the hospital relied more on public patients, it had to focus on the state government's target on improving efficiency. As such, the hospital pursued higher exploitative learning coupled with lower exploratory learning.

Apart from that, the hospital also has shown efforts to achieve ambidexterity via temporal, structural, and contextual approaches. For example, Hospital A tried to achieve temporal ambidexterity by shifting its strategy from exploring new medical competences to exploiting

existing competences and increasing efficiencies. In addition, the hospital also used a structural approach to achieve ambidexterity by having a dedicated unit specifically designed to improve its patient flow and clinical redesign areas. Last but not least, the hospital strived to achieve contextual ambidexterity by creating an innovative culture in which its organizational members were allowed to have different perspectives and develop varieties of ideas in the intuiting and interpreting phases but these members needed to integrate different views and work collaboratively to achieve the organization's goals in the integrating and institutionalizing phases.

As suggested by Berson et al. (2006), the process of intuiting and interpreting at Hospital A could be associated with exploration of new knowledge but the institutionalizing phase could be linked to exploitation of existing knowledge. Leaders strived to encourage their members to have more varieties of ideas during the intuiting and interpreting phases through a number of programs such as cross-functional meetings and a dedicated function for improving business processes. The "One Team, One Direction" cultural approach helped the hospital members integrate different perspectives through a shared common vision and direction that enabled them to work collectively to achieve the organization's goals. In addition, leaders continuously communicated updates of changes and provided relevant training to facilitate the institutionalizing process. The process of organizational learning in Hospital A could be summarized in Table 7.2.

External context	How leaders adjusted the internal context (based on the phases of 4I Organizational Learning)		Type of Innovation pursued and approaches to ambidexterity used

• **Competition**
  o Local competition and the state government's initiatives to provide healthcare closer to home promoted the redevelopment
 	
• **Customer demand**
  o Increasing healthcare service demands due to growing population, particularly the ageing population
  o The need for effective and efficient healthcare treatments
 	
• **Development of technology**
  o Advanced MRI and the smallest cardiac monitor
 	
• **Strategic partners**
  o Assistance in delivering technological-based medical innovation (i.e. smallest cardiac monitor)
 	
• **Government or regulations**
  o New government's regulations and standards promoted increased efficiency
  o Public-private partnership arrangements dictated the hospital's strategy
	Intuiting	• Leaders stimulated individual organizational members' creativity by developing their competences and motivating them to innovate through the creation of a conducive working environment:
		  o Strategy: setting strategic priorities in the provision of excellent healthcare
		  o Structure: having a dedicated unit for exploring the area of patient flow and clinical process redesign; decentralization of some decision-making (i.e. less formal rules or restrictions on administrative innovation)
		  o Culture: tolerating to a certain degree of failure, allowing new approaches, and having executives' open door policy
		  o Resources: identifying the required resources for pursuing medical innovation but also at the same time encouraging members to pursue innovation with consideration of a set of resource constraints (i.e. the need for providing high quality health services with cost effective technologies stimulated the pursuit of medical innovation); collaboration with external innovation partners (like medical technology suppliers) to pursue medical innovation (e.g. advanced MRI))
			• **Innovation**
			  o Mostly process innovations linked to efficiency (exploitation) e.g. incremental process improvements; however, few radical administrative innovation (i.e. new bed management systems) can be associated with significant process improvements (exploration)
			  o The introduction of new clinical services and some medical innovation (i.e. advanced MRI, the smallest cardiac monitor) and the establishment of a private hospital to differentiate services between private and public patients can be linked to differentiation (exploration)
			
			• **Approaches**
			
			  o Overall: focusing on a cost-leadership strategy and efficiency rather than on a differentiation strategy
			
			and also
			
			  o Temporal: the focus shift from the redevelopment of new medical services to increased operational efficiency
			
			  o Structural: a dedicated unit for exploring the area of patient flow and clinical redesign
			
			  o Contextual: the encouragement of putting forward varieties of ideas in the intuiting and interpreting process through i.e. formal cross-functional meetings and the integration of views in the integrating and institutionalizing process through the use of "One Team, One Direction" approach

	Interpreting	• Leaders provided a shared interpretation for guiding innovation activities and facilitated constructive dialogues to allow the acceptance of new ideas and insights:
		  o Strategy: communicating the above strategic priorities of the organization and emphasized the redevelopment initiatives
		  o Structure: introducing programs to initiate new thinking related to process improvements through collaboration (e.g. Toolbox and regular cross-functional meetings); appointing new personnel to bring new interpretations (i.e. new manager for patient flow and clinical redesign)
		  o Culture: creating a working environment that is conducive for knowledge sharing, such as social functions, and the "Growing the Blue" program
		  o Resources: sharing common interpretations related to resources (e.g. the coherence of human and physical resources in the adoption of medical technology)	

	Integrating	• Leaders guided the integration of new and existing knowledge by facilitating a shared understanding at both the group and organizational level to allow for coherent collective actions: o Strategy: focusing on cost-leadership or efficiency to achieve the government's target and standards (mandated by the public-private partnership contract) but still be able to pursue differentiation i.e. public and private health services	

External context	How leaders adjusted the internal context (based on the phases of 4I Organizational Learning)		Type of Innovation pursued and approaches to ambidexterity used
		o Structure: using formal regular leadership team meetings at the executive level; cross-functional teams at lower levels of management o Culture: communicating the "One Team, One Direction" philosophy to achieve integration of views and collective actions o Resources: focusing on efficiencies and compliance with the state government's requirements as mandated by its public contracts	
	Institutionalizing	• Leaders facilitated the organization-wide implementation and adoption of innovation as well as institutionalized new knowledge in such a way that enabled simultaneous pursuit of exploration and exploitation: o Strategy: monitoring the implementation of innovation strategy and making necessary adjustments to respond to external changes (e.g. while the strategy between 2009 and 2013 was to pursue redevelopment, the strategy following has shifted to achieve operational efficiency to enable the hospital to gain benefits from its new facilities) o Structure: using centralized or standardized routines to institutionalize new procedures (e.g. new bed management systems); decentralization complemented with high formalization (i.e. mostly for incremental innovation); o Culture: fostering an organizational culture or climate that supported innovation at organizational level, such as the use of "One Team, One Direction" philosophy enabled the hospital to nurture a culture that valued unity in diversity o Resources: investing on skills and infrastructures that could provide flexibility in meeting current and future hospital needs	

Table 7.2: The process of 4I Organizational Learning at Hospital A

Chapter 8: Discussion - Cross-case analysis

8.1 Introduction

This chapter discusses the comparison of the overall salient findings across the four cases and their impact on the conceptual framework developed in the literature review chapter. The similarities and differences of the external and internal contexts of the four cases, and their influence on organizational learning ambidexterity for innovation, are examined to ascertain whether the results converge to confirm the proposed framework.

In this study, the researcher interviewed 29 participants from four service organizations in different sectors, mostly from top and middle managerial levels. Table 8.1 provides a list of the number of participants who had been interviewed.

No	Organizations	Number of participants
1	Bank A	6
2	University A	12
3	Police Academy A	5
4	Hospital A	6
	Total	29

Table 8.1: Total participants

The central question that will be addressed in this study:

- How do organizational leaders facilitate organizational learning ambidexterity for innovation to respond to external challenges?

To answer such a question, the following sub-questions will be addressed:

- How do external contexts (in terms of competition, customer demands, technology development, strategic partners, and regulatory environments) affect innovation?
- How do leaders facilitate exploratory and exploitative learning within the process of 4I organizational learning to pursue innovation?

To answer the first question, the comparison of the organizations' external contexts and their impacts on innovation at the four large service organizations will be provided. For the second question, the researcher compares and contrasts how leaders at these four organizations responded to the external contexts by managing the internal contexts and considering the processes of 4I organizational learning to pursue innovation. The researcher concludes this chapter with a discussion of the different approaches to organizational learning ambidexterity in the four service organizations as part of the study.

8.2 How do external contexts affect innovation?

How leaders perceive their external environments influences organizational learning and innovation (Garcia-Morales, et al., 2006). This was confirmed by the results from this research as external factors significantly influenced the exploratory and exploitative learning for innovation in the four organizations being investigated. Although Australia was well-placed to escape the worst impacts of the global financial crisis (GFC) in 2008, the country has been facing slowing economic growth. The subdued economic growth has had the impact of intensifying domestic competition in the private sector. In addition, political pressures to return the Commonwealth Budget to surplus, in an environment of falling tax revenues, led to the reduction of government funding for most of the public sector. Due to the Australian economic slowdown, all four organizations experienced resource-constraints. As a result, most innovations were attempts to increase efficiency through process improvements.

However, the four organizations found it difficult to compete merely based on cost efficiencies and thus they tried to differentiate their services. For example, Bank A introduced several new financial products catered for niche markets and University A offered a few new courses. Hospital A also differentiated its services for public and private patients. Although the Police Academy is not in the competitive market, it also differentiated its services through the provision of updated education and training that enabled frontline officers to provide more focused and efficient policing services. However, the cases revealed that while these organizations strove to pursue both cost-leadership and differentiation strategies simultaneously, they tended to focus on efficiency (exploitation) rather than on product differentiation (exploration). This supports Cao et al.'s (2009) findings that resource-constrained organizations need to manage the trade-off between exploration and exploitation in achieving ambidexterity. The relative optimal level of exploration and exploitation, however, may vary between organizations due to their contextual differences.

Perhaps the most visible illustration of how the researched organizations resolve the competing objectives between cost-leadership and differentiation strategies is Birkinshaw and Gupta's (2013) description of how organizations may choose various investments that will potentially result in some combination of low cost and differentiated value to customers. In this study, the researched organizations strived to achieve higher efficiency by pursuing radical technological-based innovation that would lower costs in the longer term. For instance, Bank A changed its call center to a national virtual contact center and in turn increased efficiency by channelling the calls to staff in any location with the use of technology rather than centralizing these calls into one call center. The differentiated value to customers is that they would get their queries and concerns addressed by staff who were 'on the ground'. In the case of University A, it moved its entire data center infrastructure to the cloud in 2015 to improve efficiency. By doing so, internal

technical resources were concentrated on the core business activities of teaching, learning and research. However, in the four organizations studied, they were not conditioned to sustain technological excellence on their own, and thus the leaders of these organizations had to collaborate with external innovation partners to pursue technological-based innovation.

Interestingly, the findings of this study also show that exploitation and exploration in a resource-constrained environment cannot be strictly categorized in terms of efficiency and product differentiation. While efficiency is often associated with exploitation (March, 1991), some significant process improvements can also be considered as radical innovation or exploration (Davenport, 1993). For the four large service organizations in this study, exploration in a resource-constrained environment can also relate to significant process improvements to increase efficiency; exploration for them is therefore not simply about developing new products or services. Thus, in addition to the pursuit of radical technological-based innovation in an attempt to increase efficiency, the researched organizations also adopted administrative innovation i.e. structural reform. As public organizations, University A and the Police Academy A faced the strongest pressures for higher efficiency due to significant reduction in government funding. These two public organizations changed their structures significantly by adopting centralization to realize synergy and improve company-wide coordination across some functions. The centralization initiatives involved the creation of some company-wide shared services, the consolidation of smaller units into larger entities, and the reinforcement of corporate control. For example, University A centralized its financial control and shifted international and domestic student recruitment to the marketing department. Similarly, the Police Academy A established a new centralized curriculum development unit to create and facilitate a centralized consultancy for professional development within the state police which was a part of the police reform agenda.

Despite the similarities in terms of being resource-constrained, each organization faced industry or sector-specific challenges that required different solutions in regards to the areas of exploration and exploitation. Incidents or events that triggered the pursuit of innovation varied across the four cases as shown in Table 8.2.

	Bank A	University A	Police Academy A	Hospital A
Competition	Intensified competition due to the slow economic growth and regulatory change	Increased domestic competition due to the "half cohort", the student-demand-driven system, and the proposed education reform; stronger competition from international counterparts	Not in the competitive market; however, difficult to get new recruits (the policing job may no longer be attractive)	Local competition and the State Government's initiative to provide health care closer to home have promoted redevelopment of the hospital
Customer demands	Increased used of mobile banking; increased demands for niche products	Temporary decrease of domestic student demands due to "half cohort"; increased international sponsored research students	Increased policing demands due to growing population and increasing complexity for policing services along with the changes in culture and development of technology	Increasing healthcare service demands due to growing population, particularly the ageing population; the need for effective and efficient healthcare treatment
Technology development	Internet and mobile banking	Online learning and cloud computing	CCTV, CAD, Hydra, and online learning	Advanced MRI, smallest cardiac monitor
Strategic partners	Assistance in delivering technological – based innovation (e.g. online credit card verification) and administrative innovation (e.g. Heroes program)	Assistance in delivering technological – based innovation (i.e. full adoption of cloud computing) and administrative innovation (i.e. restructuring)	Assistance in delivering technological-based innovation (i.e. online learning) and administrative innovation (i.e. police reform-restructuring)	Assistance in delivering technological-based medical innovation (i.e. smallest cardiac monitor)
Regulatory environments	Standards and compliances were mostly perceived as inhibitors; however, new regulations and standards for increased accountability promoted process improvements	The proposed education reform involved significant reduction of government funding	Significant reduction in government funding and dependency on government funding	New regulations and standards promoted increased efficiency; Public-private partnership arrangements dictated the hospital's strategy
Type of innovation	Mostly process innovations linked to efficiency (exploitation) i.e. incremental business process improvements; however, few	Mostly process innovations linked to efficiency (exploitation) i.e. incremental business process improvements; however, few	Mostly process innovations linked to efficiency (exploitation) i.e. incremental process improvements; however, few radical technological-based	Mostly process innovations linked to efficiency (exploitation) i.e. incremental process improvements; however, few

	Bank A	University A	Police Academy A	Hospital A
	radical technological-based innovation (i.e. national virtual contact center) can be associated with significant process improvements (exploration) The introduction of some new financial products catered for niche market linked to differentiation (exploration)	radical technological-based innovation (i.e. cloud computing) and radical administrative innovation (i.e. structural reform) can be associated with significant process improvements (exploration) The introduction of some new courses linked to differentiation (exploration)	innovation (i.e. Hydra) and radical administrative innovation (i.e. structural reform) can be associated with significant process improvements (exploration) The introduction of updated education and training that enabled frontline officers to provide more focused and efficient policing services (i.e. community policing) can be linked to differentiation (exploration)	instances of radical administrative innovation (i.e. a new bed management system) can be associated with significant process improvements (exploration) The introduction of new clinical services and some medical innovation (i.e. advanced MRI, smallest cardiac monitor) and the establishment of a private hospital to differentiate services for private and public patients can be linked to differentiation (exploration)

Table 8.2: External contexts and the type of innovation in the four organizations

In the case of Bank A, it faced intense competitive pressure for cost reduction. This forced the bank to remove unnecessary operating cost and adopt technological-based innovation to improve its productivity and efficiency. The bank adopted more advanced online and mobile banking technology because this technology has become a necessity in conducting business within the Australian banking industry. Some of its technological-based innovations are radical, such as the establishment of the national virtual contact center previously mentioned. The bank also differentiated its product/service offerings by customizing its products to cater to the particular needs of the targeted customer groups and establishing a dedicated function with responsibility to explore opportunities in various market segments. However, to some extent, the highly regulated environment in the Australian banking industry posed considerable limitation on the pursuit of radical innovation in terms of new financial products.

In the case of University A, it anticipated reduced revenues due to significant reduction in government funding and local undergraduate enrolments in 2015, as well as a decrease in the number of international students coming to the Australian campus. At the time the research was conducted, the university also faced insecurity due to the proposed education deregulation that became nationwide debates. The university strived to manage the challenges of reduced

revenues with strategies for cost containment, resource-realignment, and enrolment growth. It underwent structural reform to streamline its processes and improve organization-wide coordination. The university also adopted technological-based innovation such as cloud computing, in order to improve efficiency. As with Bank A and Police Academy A, some process improvements at this university can be considered as radical innovation because it involved significant changes to its business processes. The university also set up a dedicated function to enhance its capability to explore opportunities, mostly in student recruitment, by providing a mechanism to capture new ideas from staff and providing guidelines for implementation based on an iterative process of funding and development.

In the case of Police Academy A, its strategy formulation was significantly influenced by the state government. The demand for policing services has been increasing and has become more complex but the state government had increasingly reduced the budget for police. Thus, the academy had to formulate strategy to deliver high quality education and training with limited resources in order to enable state police officers to perform their policing services. It strived to improve its recruitment and training practices to be more consistent with community policing practices (by encouraging local communities to participate actively in crime prevention) as suggested by the policing reform program in 2013. In addition, the academy adopted technological-based innovation, such as on-line learning, to increase efficiency significantly. Because academy members are mostly better educated in the policing areas and not necessarily in the area of technology, the academy has relied on external partners to help them with the exploration of new technologies.

In the case of Hospital A, its strategy was also affected significantly by the state government due to its public-private partnership arrangement, despite it being a private organization. New clinical services were often driven by the state government's requirements that reflected the community health care needs. The government's standards and targets also stimulated increased efficiency in the hospital. To achieve competitive advantage, the hospital differentiated its services for public and private patients. However, technological-based innovations around administrative processes were done using available resources at hand due to the strict compliance with its parent company's IT processes and its limited resources. In terms of clinical services, most technological-based innovations in the hospital were driven by best practices and introduced by physicians and/or medical suppliers.

Thus, it can be seen from the above that in all four service organizations studied, the external environment played a significant role in determining the type of innovation (exploitative or explorative) pursued. The one unifying feature in the external context of all the organizations was the resource-constrained environment imposed by the Australian economic slowdown,

which resulted in more exploitative (efficiency) than explorative (product differentiation) innovation.

In the discussion above, the researcher has demonstrated how the results and analysis from the four cases have confirmed part of the conceptual framework of the study (Figure 8.1) derived in Chapter 2 i.e. that the external context or environment of an organization plays a significant role in determining the organizational learning ambidexterity for innovation in service organizations. This has shown to be true for all the four organizations studied although they were distinctly different organizations.
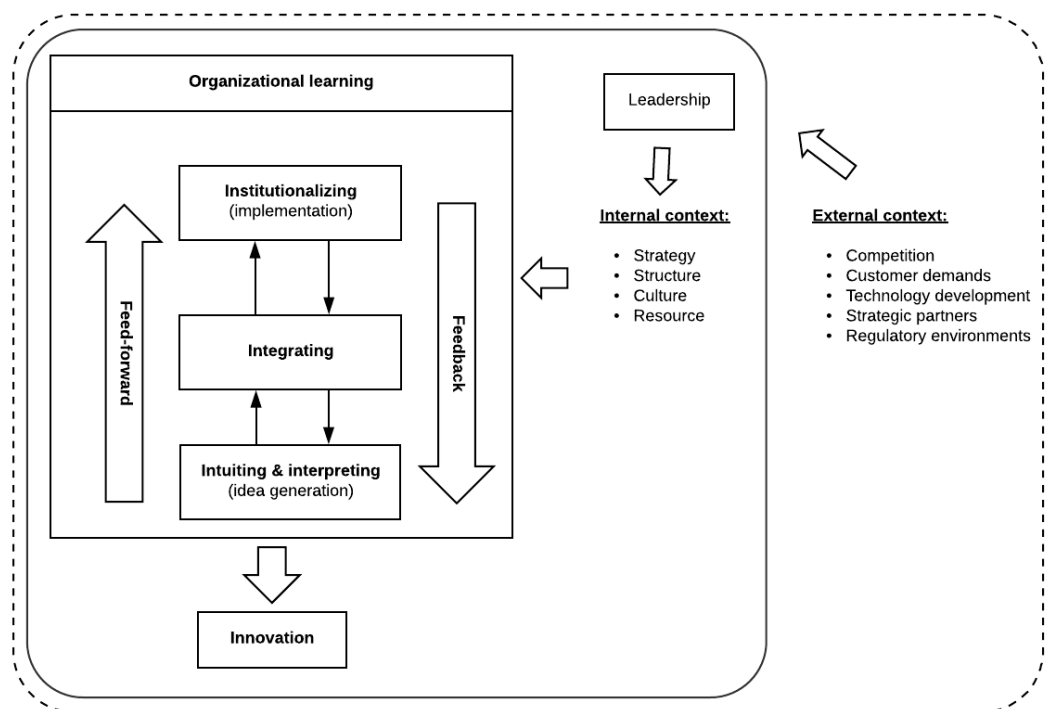
Figure 8.1: Organizational learning ambidexterity for innovation (reproduced from Chapter 2)

In examining the internal contexts of the four cases in the study (Chapters 4 to 7), results indicated that irrespective of the type of organization, leadership was the most significant internal factor that drove the direction of the organizational learning and consequently the types of innovation identified in Table 8.2 above in response to the external context. This confirms the underlying assumption of the research, i.e. that organizational leaders are the ones who facilitate organizational learning ambidexterity. In the next section, the researcher analyzes how leaders of the four organizations facilitated exploratory and exploitative learning to pursue innovation. The researcher illustrates how the results from the four organizations support the conceptual framework of organizational ambidexterity for innovation in service organizations developed at the outset of the study. The discussion will also highlight the complexities involved in providing internal contextual support for exploitative and explorative learning for innovation. The

224

discussion will also show how the various internal elements identified in the literature combine to affect organizational learning for innovation and how no one element can be studied in isolation.

8.3 How do leaders facilitate exploratory and exploitative learning within the process of 4I organizational learning to pursue innovation?

The organizational learning processes in all four cases are examined using the 4I framework (Crossan, et al., 1999) of intuiting, interpreting, integrating and institutionalizing. Berson et al. (2006) argue that exploration emphasizes the 4I learning processes of entrepreneurial intuition (new knowledge with future orientation) and interpretation, whereas exploitation stresses the process of institutionalization. During the integration process of 4I organizational learning, leaders often face intensified tension between exploring new learning and exploiting existing learning (Berson, et al., 2006). In the following sections, the researcher discusses what organizational leaders across the four cases did to provide internal contextual support to manage organizational learning ambidexterity for innovation. In Table 8.3, a comparison is made across the four cases showing how organizational leaders facilitated each process of organizational learning for innovation using the elements of the internal context identified in the literature (i.e. strategy, structure, culture, and resources).

	Bank A	University A	Police Academy A	Hospital A
Intuiting: Leaders stimulated individual organizational members' creativity by developing their competences and motivating them to innovate through the creation of a conducive working environment				
Strategy: Leaders set visions and strategic priorities to inspire their members to find innovative ways to achieve them	Strategic priorities in customer relationships, productivity, people and culture, and sustainable growth	Strategic priorities in engagement, world-class education, professional graduates, research and sustainability	Strategic priorities in people, resources, standards, community engagement, and partnerships	Strategic priorities in the provision of excellent healthcare
Structure: Leaders created a dedicated function to pursue exploration (structural ambidexterity) and decentralized some decision making for innovation	An exploratory unit to explore various market segments (i.e. Segment Business Development team); decentralization of IT function	An exploratory unit to improve revenue growth or student enrollments (e.g. Strategic Business Development Unit); more decentralized structures of "academic units"	An exploratory unit to explore opportunities for radical process improvements through police reform; more decentralized structures of IT department;	An exploratory unit to find ways to be more process innovative in the areas of patient flow and clinical processes to meet the government's target and standards; decentralization of some decision-making (i.e. less formal rules or restrictions on

	Bank A	University A	Police Academy A	Hospital A
				administrative innovation)
Culture: Leaders developed an organizational culture that promotes intuitive idea generation	A "can do" innovative culture (e.g. thinking outside the box, recognition, allocated time for innovation)	Tolerance to a certain degree of risk-taking behaviors, openness to new ideas, and thinking "outside the box"	Freedom to express novel ideas, knowledge sharing for collaborative problem solving (but the "command and control" culture tended to impede bottom-up initiatives), and recognition	Tolerance to a certain degree of failure, permission to experiment, executives' open door policy
Resources: Leaders identified the resource needs for pursuing innovation from bottom-up initiatives and secured the required resources; however, due to limitation of resources, leaders also encouraged their members to pursue innovation with consideration of a set of resource constraints	The use of IT that supported agile development and the pursuit of innovation aimed at increasing efficiency due to limited organizational resources; external innovation partners (such as external consultants) were often invited to provide input for changes (e.g. the development of employee incentive program)	The pressures of less government funding stimulated the pursuit of innovation aimed to increase efficiency; collaboration with external innovation partners to pursue innovation (e.g. cloud computing and structural reform)	The need for providing high quality policing services with less resources (less budget) became the strongest driver to pursue innovation; collaboration with external innovation partners to pursue innovation (e.g. online learning and structural reform)	The need for providing high quality health services with cost effective technologies stimulated the pursuit of medical innovation; collaboration with external innovation partners to pursue medical innovation (e.g. advanced MRI)
Interpreting: Leaders provided a shared interpretation for guiding innovation activities and facilitated constructive dialogues to allow the acceptance of new ideas and insights				
Strategy: Leaders communicated vision and strategic priorities to refocus the learning of organizational members (i.e. innovation within a resource-constrained environment)	Communicated overarching vision and strategy which emphasized productivity and innovation	Communicated the strategic vision above and emphasized "Vision of Growth" initiatives	Communicated the strategic vision above and emphasized police reform initiatives	Communicated the strategic vision above and emphasized the redevelopment initiatives
Structure: Leaders used formal structures to introduce new interpretations and facilitate	Senior leaders appointed new personnel to bring new interpretations	Senior leaders appointed new personnel to bring new interpretations	Senior leaders used the reform structures above and introduced programs to infuse	Senior leaders appointed new personnel to bring new interpretations

	Bank A	**University A**	**Police Academy A**	**Hospital A**
constructive dialogues among organizational members	(e.g. related to the Agile methodology) and introduced new programs to infuse new interpretations related to the need for innovation (e.g. Innovation Days")	(i.e. related to a corporate approach) and introduced programs to initiate new thinking related to organizational strategic objectives (i.e. Vision of Growth)	new thinking related to the structural reform (e.g. Frontline Innovation Portal)	(i.e. related to patient flow and clinical processes) and introduced programs to initiate new thinking (i.e. various cross-functional meetings)
Culture: Leaders created a knowledge-sharing culture to nourish creative behaviors and knowledge transfer among organizational members (as part of ambidextrous organizational culture that allowed organizational members to have different perspectives)	Facilitated collective interpreting by enabling interaction and knowledge exchange among staff through various mechanisms, such as the activity-based working environment and "Yammer"	Facilitated a knowledge sharing culture through various ways, such as formal and informal meetings, the use of Yammer, and values of respect; however, workloads tended to impede organizational members, particularly academic staff, from interacting and collaborating	Facilitated more two-way communications related to the police reform and provided informal and formal meetings between different groups within the academy to encourage knowledge sharing and collective interpreting	Leaders created a working environment that is conducive for interaction and collaboration, such as social functions, the "Growing the Blue" program
Resources: Leaders encouraged organizational members to interact and work together to find opportunities for collaboration and to resolve internal resource scarcity and interdependency	Shared common interpretations related to resources i.e. understanding the resource constraints (e.g. finance and legacy systems) that could limit the pursuit of innovation in Bank A	Shared common interpretations related to resources i.e. understanding the resource constraints (e.g. finance and legacy systems) and resource interdependency that limited the pursuit of innovation in University A	Shared common interpretations related to resources i.e. understanding the resource constraints (e.g. finance) that could limit the pursuit of innovation in Police Academy A	Leaders shared common interpretations related to resources i.e. understanding the resource constraints (e.g. the coherence of human and physical resources in the adoption of medical technology) that could limit the pursuit of innovation in Hospital A
Integrating: Leaders guided the integration of new and existing knowledge by facilitating a shared understanding at both the group and organizational level to allow for coherent and collective actions				
Strategy: Leaders tended to focus on efficiency and a cost-leadership strategy (exploitation) than on a differentiation	Focused on efficiency through IT-enabled innovation and strived to differentiate more	Focused on cost effectiveness and cost savings due to significant reduction in government	Focused on cost effectiveness and cost savings due to significant reduction of government	Focused on efficiency to achieve the government's targets and standards

	Bank A	University A	Police Academy A	Hospital A
strategy (exploration) but the relative optimal level of exploration and exploitation varied among the different organizations	of its financial products	funding but still wanted to be able to pursue differentiation i.e. introduction of new courses	funding (of the four researched organizations, this was the one with the least drive to differentiate its products/services, but it strived to adopt more community policing in its curriculum to differentiate its services from past practices)	(mandated by the public contracts) but still strived to be able to pursue differentiation i.e. public and private health services
Structure: Leaders used formal structures to support integration of exploitation and exploration	Used formal regular leadership team meetings at the executive levels; cross-functional teams (e.g. business and IT function) at lower levels of management	Used regular leadership team meetings (i.e. VCPMG) at the executive level; BIG team for IT governance; and cross-functional teams at lower levels of management	Used formal regular corporate board meetings at the executive levels; and cross-functional teams at lower levels of management	Used formal regular hospital leadership team meetings at the executive levels; cross-functional teams at lower levels of management
Culture: Leaders created an organizational culture that promoted integration (as part of ambidextrous culture that allows integration through shared vision)	Communicated a "can do" innovative culture and shared a common vision of "customer-focused" to achieve integration of different views	Communicated the "One University, Student First" policy to achieve integration of different views and collective actions	Communicated the reform principle and encouraged organizational members to participate in the reform process	Communicated the "One Team, One Direction" philosophy to achieve integration of different views and collective actions
Resources: Leaders prioritized the most reasonable and feasible initiative in resource-constrained circumstances	Focused on efficiencies and compliance with the government standards and regulations (e.g. Basel III)	Focused on efficiencies and compliance with the government's standards and regulations (e.g. TEQSA)	Focused on efficiencies and compliance with the state government's targets and requirements	Focused on efficiencies and compliance with the state government's requirements as mandated by its public contracts
Institutionalizing: Leaders facilitated the organization-wide implementation and adoption of innovation as well as institutionalized new knowledge in such a way that enabled the simultaneous pursuit of exploration and exploitation				
Strategy: Leaders set specific guidelines (e.g. by assigning staff to specific projects, setting up KPIs, and scheduling	Monitored the strategic implementation and made necessary structures and	Monitored the strategic implementation and made necessary structures and	Monitored the strategic implementation and made necessary structures and	Monitored the strategic implementation and made necessary structures and

	Bank A	University A	Police Academy A	Hospital A
completion times) and monitored goal achievements to enable the revision or even renewal of existing strategies	adjustments to respond to external changes or to improve results (e.g. the pursuit of IT-enabled innovation to improve efficiency and the pursuit of new financial product innovation to achieve a competitive advantage)	adjustments to respond to external changes or to improve results (e.g. the new Vice Chancellor secured adequate funds to attract renowned researchers and decentralized the recruitment for international researchers to the school levels in order to elevate the university's research performance)	adjustments to respond to external changes or to improve the results (e.g. the need for more benchmarks to evaluate the organizational performance of the academy and the inclusion of inputs from frontline police officers in the development of training and education strategy to minimize problems in implementation)	adjustments to respond to external changes or to improve the results (e.g. while the strategy between 2009 and 2013 was to pursue redevelopment initiatives, the strategy has shifted to achieve operational efficiency to enable the hospital to gain financial benefits from its new facilities)
Structure: Leaders used different structures for different parts of the organization to institutionalize innovation	More decentralized structures in implementing IT-enabled innovation and some financial product innovation initiatives (e.g. decentralized "Card teams")	Centralization to implement radical and organization-wide changes (e.g. structural reform) and decentralization with high formalization to implement schools' initiatives	Centralization to implement radical and organization-wide changes (e.g. structural reform); a more decentralized structures for IT Department	Centralized or standardized routines to institutionalize new procedures (e.g. new bed management systems); decentralization complemented with high formalization to implement mostly incremental innovation
Culture: Leaders institutionalized practices, values, and norms at the organizational level that could support innovation, in particular, to create an ambidextrous culture	Fostering a "can do" innovative culture which involved the combination of an activity-based working environment and agile methodology to improve communication and coordination among staff	Facilitated communication and coordination to disseminate institutionalized knowledge in University A	Facilitated communication and coordination through the reform program structure to disseminate institutionalized knowledge in Police Academy A	Facilitated the institutionalization of "One Team, One Direction" philosophy to nurture a culture that valued unity in diversity and in turn promote ambidextrous innovation
Resources: Leaders institutionalized new skills and infrastructures that could develop resource and coordination flexibility to meet	Provision of more agile training courses and adoption of recruitment policy to support the institutionalization of agile methods;	Provision of training and professional development (e.g. supervisory and project management) to upgrade existing	Provision of training and professional development (e.g. leadership) to upgrade existing human resources to meet existing	Provision of training and professional development (e.g. new routines for new medical services) to upgrade existing

	Bank A	**University A**	**Police Academy A**	**Hospital A**
existing and future business requirements	investments in infrastructure (i.e. cloud computing, virtualization) that could provide flexibility; the need for relaxing its agile project scope due to fixed budgeting	human resources to meet existing and future needs; investments in infrastructure (i.e. cloud computing) that could provide flexibility	and future needs; trying to invest in infrastructure that could provide flexibility however having to do it by applying strict adherence to the state budget in implementing innovation projects	human resources to meet existing and future needs; investing in infrastructures (e.g. medical technology) that could provide flexibility in meeting current and future needs

Table 8.3: How leaders facilitated exploratory and exploitative learning for innovation

To sum up, in the intuiting and interpreting phases, top leaders set and communicated visions and strategic priorities to inspire their members to find innovative ways to achieve them. They tried to identify the resource needs for pursuing innovation from bottom-up initiatives. Middle managers organized the necessary structure, people and systems to promote bottom-up initiatives. For example, they established exploratory units, conducted cross-functional meetings, or provided rewards to motivate the development of new innovative ideas. They also become advocates of bottom-up initiatives by championing the initiatives with most prospects to top management. Operating managers encouraged new ideas and experimentation with novel solutions to emerging problems at the shop floor. New initiatives with bigger scope or impact were proposed to upper management to seek approval.

In the integrating phase, top leaders used vision and strategic priorities to develop common language and shared mental models to achieve a common understanding to achieve organizational goals. Middle managers strived to resolve contradiction between visionary but abstract concepts of top management and practical and specific concepts of the operational level. Having the most complete understanding of the organization's strategic contexts, top leaders evaluated innovation initiatives and made decisions around strategic resource allocation. Since most resource allocation processes tended to take place at the top level of management, the integration between senior leaders and organizational members was often focused on obtaining acceptance of senior management's decisions. Operating managers were expected to conform to the given direction. Through continuing and active conversations, areas of difference and agreement were identified and reconciled to achieve shared understanding for the pursuit of innovation in the integrating phase.

In the institutionalizing phase, top leaders provided leadership and endorsement to minimize the inertia in the human capital and administrative systems that hampered the implementation of innovation strategy. Middle managers organized the required structure, people and systems to implement the chosen innovation initiatives. Operating managers were required to adapt their operating procedures and policies to conform to the innovation strategy. Leaders at different

levels of management provided regular communications and encouraged open dialogues with organizational members about the proposed changes. Communication facilitated the development of shared understanding which in turn became an avenue for coordinated actions to further institutionalize new innovation initiatives. Since organizational members were unfamiliar with the innovation, adequate and relevant training was also needed to institutionalize the innovation in order to ensure successful implementation.

In the next section, the researcher provides a discussion of contextual support for the intuiting phase of the 4I organizational learning for innovation.

8.3.1   Intuiting

As elaborated in the literature review in Chapter 2, intuiting occurs at the individual level. In the intuiting phase, individuals develop new ideas or insights based on personal experience. Lin and Sanders (2017) opine that leaders need to be able to develop individual members' competence to foster intuition and to motivate them further to pursue innovation through various human resource management practices, such as training and compensation. According to Schilling and Kluge (2009), leaders should also minimize all forms of obstacles that prevent novel insights and innovative ideas. The authors identify the following barriers to intuiting: organizational members' restricted mindsets; the content of the knowledge and its cultural origin, bureaucratic restrictions and roles, and fear of failure and blame. In addition, leaders can establish dedicated units for exploration (i.e. structural ambidexterity) to provide space and resources to initiate and implement a new initiative (O'Reilly III & Tushman, 2011).

In all the four organizations in the study it was the top-level leaders' ability to identify the need for new competences to meet the demands of the external environment that fueled innovation. As such, the societal and environmental cues like the government's strategic agenda and regulatory changes were used to initiate mostly exploitative innovation. This could be likened to the expert view of interpreting, where the leaders perceive external opportunities and threats based on their experiences. This is in line with Crossan et. al's (1999) opinion that expert intuition supports exploitation. In addition, most of the few exploratory innovations in the researched organizations were also driven by senior leaders' entrepreneurial intuition through their strategic visions. In all four cases, the data gathered showed that the most senior leader in each organization was seen as the source of entrepreneurial intuition for exploratory innovation. The Police Commissioner was credited with the police reform in 2013, which affected how operations were run in the Police Academy. The CEO of Hospital A was seen to be the driving force for the redevelopment of the hospital and its private operations. The Vice-Chancellor was accredited with positioning University A to be known for its teaching quality and support for students; and the CEO of Bank A was the driving force for innovation.

In three of the four cases, there was evidence of formal mechanisms to elicit ideas from the frontline employees or from those at the operational levels, and formal and informal reward and recognition mechanisms existed for idea generation. However, the use of Yammer and the 'Heroes' program in the case of Bank A, the Frontline innovation portal and individual recognition of innovative ideas in Police Academy A, movie tickets, bottles of wine, time, or study leave in Hospital A, did not appear to yield many exploratory ideas from staff at the lower levels of the organization. In the case of the University, although there were no formal mechanisms (like Yammer) to collect innovative ideas from all employees, the reward and recognition structures were well defined in some areas (e.g. academic staff). For example, an academic's innovation in research could be measured by the commercialization of research ideas and winning research grants and awards. Innovation in teaching could be rewarded by teaching awards/grants. These grants and awards count towards promotion. However, the elicitation of innovative ideas from other parts of the University was left at department or unit level and for middle management to channel these innovative ideas up. The findings therefore indicate that while the role of leadership is very important in promoting bottom-line initiatives or feed-forward learning by providing internal contextual support, this appears to not be done well in the four organizations studied in terms of exploratory innovation. This could be the result of the resource-constrained environment and will be explored further in the following paragraphs.

The literature shows that through their *strategic* visions, leaders can inspire their organizational members to find novel ways to achieve the visions through the pursuit of innovation. Each of the four organizations had a vision and strategic priorities to drive the members' pattern of attention towards new relevant knowledge for pursuing innovation and in turn achieving the organizations' goals. The vision and high-order strategies were required to provide some level of direction to the organizational members but at the same time were not too explicit so that the members still had a certain degree of freedom to find novel routes to achieve the organizations' objectives as suggested by Hunter and Cushenbery (2011). The 'strategic visions' of the leaders could also be construed as the metaphors that Crossan et al. (1999) highlighted for individual entrepreneurial intuition. In examining all the four cases, the researcher found that the strategic direction or visions were very much driven by the external context. Hospital A's strategic direction was significantly influenced by the state government's agenda and its private operations governed by industry standards (e.g. time taken to develop and test new medical procedures). The University while seeking to differentiate itself with its teaching quality and support for students still had to do so in an environment which was controlled by the federal purse and by industry regulations (e.g. TEQSA). The Police Academy, although operating in an environment of reform, had to do so with reduced government funding. Even as the only pure private organization studied, Bank A had a strategic vision, which while driven by customer

demand, was still couched in terms of 'efficiency', 'productivity improvements' and growing the business in a risk-aware and disciplined manner. It was still constrained by industry regulations, norms (e.g. customers not being receptive to new products that were too radical) and external control of its parent company. Thus while the strategic visions did contain some forward-looking connotations, it appears that it was not enough to motivate greater exploratory innovation at the grassroots. It could be that, as proposed by Schilling and Kluge (2009), the barriers to intuition in this case stem from the fact that the knowledge itself is implicit and ambiguous (i.e. what does innovation mean at the frontline of services like policing and banking and can clear goals be set for achievement?).

One way to counter the tendency towards exploitative innovation is to have a structural ambidexterity approach as suggested by Tushman and O'Reilly III (1996). In the four organizations in this study, the resource-constrained environment they faced forced them to implement cost leadership strategies, further signaling the tendency towards exploitation. Nevertheless, to provide the space and resources for pursuing exploratory innovations, leaders of the four organizations did establish separate *structural* units for exploration. Exploration activities were different across the researched organizations to reflect their distinct strategic priorities. By having the dedicated functions to seek out explorative innovation, leaders in these organizations attempted to balance exploitation of existing competences and exploration of new competences. The counter argument to having structural ambidexterity in this way is that it could signal bureaucratic restrictions and narrowly-defined roles, which according to Schilling and Kluge (2009), could be a barrier to the intuiting process. In Bank A, for example, the role of the Senior Manager of Innovation was to spearhead the vision of innovation that the CEO proclaimed. The Senior Manager of Innovation had driven initiatives like the "Innovation Day" and the IDEA framework for managing innovation. However, a short time after the data from Bank A was collected, the role of Senior Manager of Innovation was abolished as the organization felt that innovation values needed to be developed bottom-up by broader organization members and that innovation should be seen as every organization member's responsibility.

The leaders of the four organizations also strived to decentralize some decision-making for innovation whenever possible to promote feed-forward learning. It was expected that leaders at lower levels of management could make innovation decisions quickly in order to respond to dynamic business challenges. There were still processes for consultation with the other relevant stakeholders on whom the innovation initiatives would impact. However, the level of decentralization was different across the four organizations and even in different departments within the same organization due to specific tasks at hand in each organization or department. For instance, as in the case of University A, the "academic" units were more decentralized than "non-academic" units.

Leaders of the four organizations also tried to develop an organizational *culture* that could promote intuitive idea generation in the process of learning for innovation. For example, leaders stimulated their members to think about new ways of doing things by questioning existing processes, workflows, and/or structures. To promote exploratory ideas in the process of learning for innovation, some leaders of the researched organizations also tolerated some degrees of failure and allowed their members to experiment with new approaches. This finding supports the argument of Naranjo-Valencia et al. (2011) that an organizational culture characterized by willingness to take risks is more conducive for innovation. Respondents in this study were also of the opinion that organizations needed to take calculated risks to encourage innovation and that risks should not be seen as reasons for not taking on new initiatives. Nevertheless, risk-averse behaviors could still be found among leaders in the researched organizations. Managers were restricted by the need to meet operational KPIs (Key Performance Indicators) that often overemphasized short-term financial gains. As such, these managers tended to exploit existing strategies rather than explore new strategies resulting in more exploitative innovations. In the context of the resource-constrained environment, leaders of the researched organizations also tended to avoid exploratory innovation with high risks and often preferred short-term financial benefits to overcome temporary budget shortages. In addition, the levels of risk tolerance varied across the four researched organizations and even between different units within the same organization. For example, Hospital A was more cautious in adopting new technology (particularly for medical innovation) in its exploratory innovation endeavors as compared to the other researched organizations. This was due to patient safety concerns which could be one of the reasons for the low level of exploratory learning among the staff at lower levels of the organization.

In addition to the creation of a suitable organizational culture for innovation as described above, leaders also had to identify *resource* needs for pursuing innovation from the 'shop floor' and secure the required resources. This bottom-up process of resource need identification stimulated the pursuit of exploratory innovation in the researched organizations. For example, in the case of Hospital A, the needs for new medical technology infrastructure in the pursuit of medical innovation were identified from front-line members, such as medical practitioners. In the context of resource-constrained environment, leaders further encouraged organizational members to pursue innovation with consideration of the resource constraints.

While slack resources are usually required for innovation, the lack of resources can also stimulate innovation requiring organization members to innovate using available resources at hand, or to "bricolage" (Cunha, et al., 2014). This appeared to be the case in most of the researched organizations, particularly in the public organizations (Police Academy A and University A) as they were significantly affected by the considerable reduction in government funding. In the context of a resource-constrained environment, all the researched organizations

strived to achieve increased efficiency through administrative innovation and/or technological-based innovation. Financial resources were often viewed as an inhibitor for adopting technological-based innovation that required high cost, and as such, all the researched organizations tried to source funding from external sources when possible. For example, in the case of Hospital A, the CEO was innovative in securing funding from both the parent company and the government for the redevelopment initiatives. In cases where external funding was difficult to obtain, all the organizations tried to minimize the costs of pursuing technological-based innovation by reducing the need for acquiring totally new infrastructure or by using available resources at hand. In addition to financial constraints, human resources with lack of know-how or capabilities in new areas for innovation were often mentioned as inhibitors to innovation in the cases examined. Because the organizations did not have all the required sets of skills and knowledge for undertaking innovation initiatives, leaders of the researched organizations collaborated with suppliers or other external strategic innovation partners to pursue innovation. These external strategic innovation partners provided intuitive ideas in best practices and cutting-edge technology. Lastly, legacy systems were also listed by interview respondents as inhibitors to pursue radical technological-based innovation. The range of technological-based innovation that could be implemented was often limited by its compatibility with the existing legacy systems.

From the above discussion, it would appear that in the intuiting or idea generation phase of organizational learning, the leaders of the four organizations appeared to 'tick the boxes' as far as providing support for both exploitative and exploratory learning. While all the organizations in the study achieved ambidexterity, they focused more on exploitative learning than exploratory learning. This was largely due to the effects of the organizations' external environment.

According to the Crossan et al. (1999), in the intuiting phase, intuitive ideas from individuals were often vague and imprecise, requiring further articulation through collective interpreting processes in order to crystallize them and to make them more concrete. In addition, the exchange of knowledge among individuals and groups in the collective interpreting process could also promote the development of new intuitive ideas or insights. This is in line with Berson et al.'s (2006) argument that intuiting and interpreting are highly interrelated in the process of exploration of new ideas or insights. For example, an environment with an open culture can both facilitate intuiting and interpreting phases, not only by encouraging organizational members to openly express novel ideas for others to interpret but also by stimulating creativity in the intuition process as a result of the interpretation. The next section examines the interpreting phase of 4I organizational learning for innovation in the four organizations studied.

8.3.2 Interpreting

Where the intuiting phase above was about encouraging any individual in the organization to have novel insights and innovative ideas, the interpreting phase is about facilitating constructive dialogues at group levels to allow the creation of new perspectives. The collective interpreting process in the idea generation for innovation is required to provide enriched interpretations from multiple perspectives. Through interaction between organizational members, new knowledge can be created. A dialogue or even debate among organizational members with different perspectives, skills and knowledge could lead to a shift to a new point of view (Nonaka, 1988) which is required in the process of exploratory innovation. During the interpreting phase, senior leaders of the four researched organizations facilitated the group process of interpretation by promoting interaction amongst organizational members.

Top leaders of the organizations communicated the organization's vision and *strategic* priorities to provide a source of shared interpretation that guided innovation activities within the organization. These leaders provided the overall direction of the organizations and set the time limit (e.g. 5-year plan in the case of University A) to realize this strategic direction. In the resource-constrained environment, top leaders in all the four organizations tended to focus on efficiency or a cost-leadership strategy. Consequently, organizational members were encouraged to pursue process improvements to increase efficiency. However, the levels of pressure for improved efficiency were different across the four cases. For example, Police Academy A faced the strongest efficiency pressures because of its reliance on government funding for its operations which was reduced significantly. At the time the study was undertaken, public institutions faced uncertainties as they waited for the Federal Government's next move in its programs and budget and they had to be able to anticipate any budget changes and budgets were expected to decrease. As such, the interpretation around the strategic vision was weighted towards efficiency or exploitation and this could also be one of the contributing factors to the low levels of exploration in terms of product differentiation at the lower levels of the organization.

Top management in the researched organizations also used organizational *structures* to influence the interpreting process by reorganizing the leadership team or bringing in new programs and leaders to introduce new perspectives into the organization. The newly selected leaders facilitated new interpretations required for an effective formulation and implementation of overall organizational strategy. For instance, in the case of Bank A, senior leaders recruited new personnel to bring in new interpretations related to the agile methodology in order to encourage the pursuit of IT-enabled innovations relevant to its strategic objectives. As an example of introducing new programs to initiate new thinking to achieve the organization's strategic direction, University A's leaders initiated the "Vision of Growth" to enable the

university to grow during the anticipated resource-constrained period of reduced government funding and intense competition. Using the "Vision of Growth", leaders introduced new perspectives about the need for improved efficiency and an appropriate business capability model to generate more revenue (i.e. a new business development capability to deliver growth in domestic and international student enrollments).

In theory, while top management's visionary and strategic priorities may be clear about the overall direction of the organization, these visions and strategic priorities could often be abstract when it came to specific actions. Through interaction and work with both top and operational-levels of management, middle management is required to combine broad strategic information from the top and hands-on specific information from operational levels in order to establish a definite direction for resource deployment and specific actions to put the strategy into practice (Nonaka, 1988). Respondents at Bank A and Police Academy A explicitly mentioned that the middle management had an important role in mediating operational-level leaders and top leaders. They were responsible to both channel up the most promising initiatives to top management (feed-forward learning) and cascade down strategic directives to operating levels (feed-back learning). The data also suggests that this could be a bottleneck that contributes to the low level of exploratory learning at the lower levels of the organization as evidenced by the small number of implemented innovative ideas that emanated from that level.

Insights or ideas coming from bottom-up initiatives (or feed-forward learning) can stimulate exploratory innovation because these ideas often indicate the need for development of new organizational competencies. For instance, as mentioned earlier, frontline employees at Bank A viewed the need for new competencies in mobile banking. As such, in the interpreting process where organizational members explain their ideas to others or other groups in the organization, leaders should provide internal contextual support that can facilitate the communication of new ideas to other organizational members. For example, Bank A had "Innovation Days" and "Yammer" and Police Academy A had "IdeaScale" for their organizational members to channel their ideas to top management. However apart from the mobile banking idea in the case of Bank A, there is no evidence that the researched organizations could put forth to show the implementation of exploratory ideas that emanated from the frontline staff. This suggests that, although implemented ideas may have come from operational levels of the organization, the evidence of such may not exist unless strict records are kept.

Interestingly, as clearly shown in the case of University A and Hospital A, interviewees were of the opinion that the use of formalized risk identification procedures in these organizations could also promote bottom-up initiatives or feed-forward learning as staff at all levels are asked to identify risks. As such, in some circumstances, a certain degree of formalization in some areas could stimulate ideas from the frontline employees and could be a source of bottom-up

initiatives and in turn exploratory innovation which is also evidenced in the study of Wei et al. (2011). However, generally, high levels of formalization in the phases of intuiting and interpreting can discourage the development of exploratory ideas as a higher level of flexibility is required in the initiation phase of innovation to enable organization members to find novel solutions (Mattes, 2014).

To promote more exploratory ideas, leaders of the four organizations also conducted formal meetings that enabled organizational members from different levels of management and different organizational units to interact and collaborate. These leaders also formed cross-functional teams to work on innovation projects. As organizational members collaborated and worked together, they developed cognitive understanding of the finer details of ideas and transferred tacit knowledge. In this way, leaders strived to develop individual and group competence for interpreting new possibilities by focusing more on skill-based development (generalist) than function-based development (specialist) as suggested by Kang and Snell (2009). Skill-based development enabled organizational members to utilize knowledge beyond their own (functional) domain and in turn promoted exploratory learning. Through the above organizational structures and procedures, leaders of the four researched organizations also tried to create a knowledge-sharing culture that could nourish creative behaviors and knowledge transfer required for the pursuit of innovation.

A knowledge-sharing *culture* is also conducive for facilitating a collective interpreting process. Both formal and informal meetings at the four researched organizations enabled organizational members to meet and converse which in turn led to knowledge-sharing at the group levels. The lateral ties developed by organizational members during these meetings gave them the social support required for clarifying or crystallizing their ideas in the phase of interpreting. According to Kang and Snell (2009), having interaction and collaboration with other organizational members from different levels of management and different functional areas exposes staff to multiple perspectives or new knowledge outside their own functional domain and this could stimulate the development of exploratory initiatives. However, as shown in the case of Police Academy A, when formal meetings only served as occasions for telling organizational members what to do without allowing them to contribute their ideas or insights, these meetings could not be a facilitator for knowledge sharing and problem solving in the process of idea generation. In addition, organizational members could be reluctant to share knowledge if they viewed knowledge as "power" or a strong differentiator in achieving career aspirations. As such, leaders should frame knowledge sharing as opportunities for collaborative problem solving and also provide teamwork-based rewards to promote knowledge sharing behaviors.

Knowledge sharing behaviors could also be discouraged if organizational members lacked time to interact and collaborate. For example, respondents at both Bank A and University A

explicitly mentioned that they were often occupied with daily operational activities and did not have time to engage in exploratory activities. To minimize these problems, leaders should allocate specific time for organizational members to participate in innovation activities, for example by having "Innovation Days" in the case of Bank A.

In addition, separate physical work environments could also impede interaction and in turn knowledge sharing among organizational members. To address this matter, as in the case of Bank A, leaders adopted an activity-based working environment that allowed organizational members to collocate with other members to work on innovation projects. At Hospital A, leaders provided a central dining room that enabled organizational members to interact with each other and exchange knowledge in an informal way. However, in the case of University A, functional areas were located in different buildings, and this was perceived to be barriers to knowledge sharing.

Leaders of the researched organizations also used internal corporate social networking or other communication means to promote knowledge sharing among organizational members. For instance, organizational members at Bank A and University A used "Yammer". While in Bank A it was used for staff to communicate their ideas and exchange knowledge, in University A it was not identified as a knowledge sharing tool for innovation and appeared to be more a social tool or for specific invitation-only groups for notices of events. Although there was increasing use of online knowledge sharing communities of practice in the researched organizations, virtual communities and face-to-face meetings were not mutually exclusive but complemented each other in promoting knowledge sharing behaviors among organizational members. This is because knowledge-based trust that motivates organizational members to join virtual communities can be more readily achieved if trust has been established in face-to-face communities (Ardichvilli, et al., 2003).

Leaders also strived to foster norms and values that could support knowledge sharing cultures in the interpreting process. The values of openness to new ideas, respect, and trust allowed members at the researched organizations to have different views and opinions and exchange knowledge. A culture such as this could enable organizational members to have task-related diversity in terms of skills, knowledge, and professional perspectives in order to support exploratory ideas. Wang and Rafiq (2014) define this sort of a culture as an ambidextrous organizational culture (comprising organizational diversity and shared vision) and showed that it was positively related to contextual ambidexterity (exploration and exploitation integrated within a single business unit). The findings suggest that the four organizations in this study practiced both structural and contextual ambidexterity. They had separate units for exploratory activities but at the same time were trying to build an organizational culture where innovation

was everyone's responsibility and therefore a single business unit could pursue both exploratory and exploitative innovation using the requisite type of organizational learning.

Aspects of interpersonal relationships often dominate barriers to interpretation (Schilling & Kluge, 2009). For example, the ability of individuals who had innovative ideas to sell their ideas often had great impacts on the acceptance of these ideas by their co-workers or groups within the organizations. A respondent of Bank A explicitly mentioned about the importance of skills in selling ideas and was of the opinion that "Yammer" was only useful for sharing ideas but organizational members who had innovative ideas should be able to convince others in order to realize these ideas. Selling their ideas should also include communicating the costs and benefits of those ideas. In the case of Bank A, one leader participant often used analogy in communicating complex and unfamiliar innovation concepts. This was done so that other members could understand these concepts more easily and be convinced to work together to realize these ideas.

In the interpreting phase, leaders of the four researched organizations also encouraged their organizational members to interact and work together to find opportunities for collaboration and resolve internal *resource* scarcity and interdependency. As such, they could work collectively to find possible innovative solutions within a set of constrained resources. For example, organizational members had to consider the compatibility of new technology with existing technology, the required skills, and the costs associated with the pursuit of the technological-based innovation. While they may collaborate with other functional areas or even external innovation partners to bring in new interpretations for the possible pursuit of new ideas, they still had to do so within a set of constrained resources.

The above analysis shows that across the four cases, given their hierarchical structures and the various levels of management and functions, the intuiting and interpreting phases of the 4I model was a complex process. This was compounded by the resource-constrained context they faced and the type of organizations they are (service oriented). The findings indicate that in these four organizations, there were limited opportunities to convert innovative ideas from the ground up into actual initiatives. This could explain the reason why despite the various measures to stimulate exploratory learning at all levels of the organization, most of the entrepreneurial intuition was credited to the senior leaders. It could also explain why there was more exploitation than exploration i.e. although the four organizations encouraged exploration of new ideas, most of the learning or intuition was framed in the context of needing to be cost effective and do more with less.

In the intuiting and interpreting phases of organizational learning, the emphasis of leaders in the four organizations was on stimulating exploration of new knowledge and in turn diversifying

initiatives, albeit within resource constraints. Theoretically, this could result in different perspectives that could affect the integration process required to facilitate organizational learning from the individual to the group level as well as from exploiting the new knowledge gained to realize them. In the next section, the researcher discusses how the organizations studied approached the integrating process of the 4I model given the specific contexts they faced.

8.3.3 Integrating

In the integrating phase, leaders of the four organizations tried to integrate different views and promote collective actions or collaboration among organizational members to achieve the organization's goals. Individuals and/or groups were likely to have different perceptions about the need for innovation due the variety of contexts they faced within the organization (i.e. divisional, functional, or hierarchical). For instance, in the case of Bank A, business and IT people within the organization often had different views about the need for new IT-enabled innovation. The levels of diversity in terms of perspectives, skills and knowledge also varied across the four organizations and posed different levels of challenges in the interpretation phase to the integration (feed-forward) phase in organizational learning.

The top leaders of the four researched organizations used vision and *strategic* priorities to develop common language and shared mental models to achieve a common understanding to achieve organizational goals. However, each individual member might have his or her own interpretation that might not be readily compatible with the organization's vision. As implied by respondents from Bank A and Police Academy A, middle managers should be able to resolve the contradiction between visionary but abstract concepts of top management and the practical and specific concepts of operational level. They were also of the opinion that top-down and bottom-up knowledge inflows needed to be integrated to create concrete innovation initiatives based on the common vision and strategic direction. However, the cross-case analysis shows that middle managers sometimes found it difficult to mediate the conflicting interests between operating and top management in the process of strategic changes for innovation. These findings indicate that the different hierarchical contexts faced by managers at the top and operational levels are likely to cause managers to interpret the need and urgency for innovation differently, which is similar to what has been found in existing literature. Middle managers have conflicting demands that may force them to choose the stronger and more salient role demand that often comes from the top management (e.g. Grover, 1993). In addition, these middle managers may fail to recognize the potential ideas from operational levels and may not put forward these ideas to the top levels of management. Given the strong effect of the resource-constrained environment and the interpretations of efficiency and cost-effectiveness that this promulgated, a top-down orientation to learning was more prevalent than a bottom-up orientation in the

researched organizations which is another reason for the entrepreneurial intuition being ascribed to the most senior level leaders.

However, when strategic formulation activities occur mainly at the top, the formulation of strategies sometimes moves far from the operational point of view and may create potential problems for its implementation. In the integrating phase, leaders of the four organizations often faced tensions between exploration and exploitation activities and they needed to balance these two activities when formulating and implementing their organizational strategy. As outlined in the literature review, organizations need to have *strategic* flexibility by pursuing both cost-leadership and differentiation strategies simultaneously to enable them to respond to ever-changing environment (Santos-Vijande, et al., 2012). According to March (1991), efficiency can be associated with exploitation. On the other hand, a differentiation strategy is closely related to variation, and March (1991) considers variation as part of exploration. Ideally, organizations need to pursue both cost leadership (exploitation) and differentiation (exploration) strategies simultaneously to achieve above average business performance (C. B. Li & Li, 2008). Nevertheless, they have to avoid formulating "a stuck in the middle strategy" where they fail to pursue either a cost leadership or a differentiation strategy (Porter, 1980). As mentioned earlier in this chapter, the researched organizations tended to pursue higher efficiency (exploitation) in a resource-constrained environment. However, these organizations also needed to differentiate their services (exploration) because higher efficiency was not sufficient to achieve growth in a challenging resource-constrained environment. As such, they had to balance cost-leadership or efficiency and a differentiation strategy. One option that appeared to be used to accomplish this was to develop new customized services by recombining existing capabilities. For instance, University A introduced a new course in professional communication that was developed from existing capabilities across multi-disciplinary areas, such as advertising, journalism, and public relations. Nevertheless, the relative optimal levels of exploration and exploitation varied between the four researched organizations since they had different levels of organizational resources for exploration and different environmental contexts that required different solutions. The tendency for focusing on cost-leadership or efficiency was higher among the public organizations compared to their private counterparts due to high influence of the government's funding on budget structures. Conversely, the competitive pressure for product innovation or differentiation was higher in private than public organizations. For example, while Bank A also focused on cost-leadership and efficiency, it strived to pursue more differentiation strategies by customizing new financial products for different market segments. While customer input may be less useful in the case of radically new products, organizations need to better understand the match between latent (not clearly visible) customer needs and new innovative solutions to enable them to deliver successful radical innovations. The case of Bank A clearly illustrates that

the implementation of a new radical change to create customer demands without much consultation with lead customers has not proven to be successful.

In addition to strategy, leaders of the four organizations also used formal *structures* to support the integration of perspectives around ideas or views about innovation. As mentioned in discussing the earlier phases, leaders of the four researched organizations established dedicated "exploratory" units (using structural ambidexterity) to encourage organizational members to explore new knowledge in particular areas as dictated by its organizational strategic direction. In the integrating phase, top leaders of these organizations strived to integrate views or perspectives around exploration and exploitation activities within the organizations. Having the most complete understanding of the organization's strategic contexts, these top leaders evaluated innovation initiatives and made decisions around strategic resource allocation. In the four researched organizations, formal meetings facilitated conversation, knowledge-exchange, and collaboration among the members of the top management team. They could openly discuss and debate conflicting demands of exploration and exploitation which in turn enabled them to evaluate and reconfigure potential combinations of knowledge sources at differentiated exploratory and exploitative units. However, the resource-constrained environment faced still directed the integration of ideas around the types of innovation that would be the most beneficial.

Leaders of the four organizations also formed cross-functional teams to work on particular innovation projects. These team members exchanged knowledge and developed shared understanding while they interacted and worked together. The team members comprised individuals across different functional units, including both "exploratory" and "exploitative" units. In this way, cross-functional teams could help the integration of exploratory and exploitative activities at lower levels of management by facilitating knowledge exchange and coordination between the "exploratory" and "exploitative" units as proposed by Jansen et al. (2009). For instance, in the case of University A, cross-functional teams consisted of members from the Centre for Learning and Development and academic members across schools, working collectively on online course projects. However, it must be acknowledged that the move to online courses was still a top-down push driven by the need for increased efficiency and market demands.

Another aspect of integration is getting consensus or agreement about the type of structures to adopt for innovation i.e. centralizing or decentralizing operations. According to Raisch (2008), organizations also need to be able to integrate both centralization and decentralization in a way that enables them to promote synergy and coordination but still allows business units to pursue innovation. Results across the four cases studied show that leaders used a centralized structure for their back-office functions to enable synergy and improve company-wide coordination in a

move to minimize process redundancies and enable resource sharing, as well as to promote collaboration across functional areas and increase efficiency. For example, in the case of University A, the university centralized its IT services. In this way, business units wanting to adopt new technology should consult with other related business units to check for technological compatibility and redundancies. Similarly, the police academy established a new centralized curriculum development unit to create and facilitate a centralized consultancy for professional development within the state police. It appears that efficiencies drove the integration of ideas around the best structures for balancing exploration and exploitation i.e. centralization and decentralization. However, such centralization of administrative functions although only in back-office functions, could send a signal of standardization and conformity. Employees at the lower levels of the organization may withhold their innovative ideas if they perceive that the resources they need to realize or implement their innovative ideas (e.g. dedicated support services) are not forthcoming. This makes the task of integrating the different views about the direction of innovation even more delicate.

In terms of the role of organizational culture in the integrating phase, unifying individual visions and creating a larger vision to guide future individual visions is difficult to achieve due to different individual interests. While leaders of the researched organizations strived to develop an organizational *culture* that promoted integration, compared to other researched organizations, leaders of the hospital were relatively more successful in facilitating the growth and the development of such an organizational culture using their "One Team, One Direction" approach. Through regular workshops like "Growing the Blue", leaders of the hospital tried to develop a common 'language' and a shared understanding by involving a more bottom-up approach. As previously mentioned in the intuiting and interpreting phases, leaders of the four researched organizations allowed their members to have different views and encouraged varieties of ideas. However, in the integrating phase, the leaders tried to integrate different views to achieve a common understanding and encouraged their members to work collectively to achieve the organization's goals. Such a move could also be considered to be an attempt to create the ambidextrous organizational culture as described by Wang and Rafiq (2014) as mentioned earlier. While structural differentiation or separation between 'exploratory' and 'exploitative' units tends to focus on variation in stimulating exploratory initiatives, a contextual approach to ambidexterity is more likely to emphasize integration. The data from this study thus shows that across the four cases studied, leaders strived to use both structural differentiation and contextual approaches in a complementary manner in reconciling the tension between exploration and exploitation as suggested by Birkinshaw and Gibson (2004).

In the integrating phase, leaders in the four organizations were required to prioritize innovation initiatives because they had limited *resources*. All the researched organizations had formal procedures to prioritize the most reasonable and feasible initiatives in order to resolve tension or

conflicts among different individuals and/or groups due to the intense competition for resources. Leaders evaluated and selected innovative initiatives against particular criteria that could best deal with the actualization of the organization's strategic goals. The criteria included potential benefits, costs, required resources, risks, and compliance with the government's regulations and standards.

In addition, leaders of the four researched organizations also strived to balance top-down and bottom-up approaches in their resource allocation process in the integrating process. However, in public organizations, like University A and Police Academy A, resource allocation processes mostly happened at the top level of management because the organizations' budget structures were significantly influenced by the government's funding framework. Similarly, due to its public contract, Hospital A also tended to guide the budgeting process from the top although it had tried to involve a more bottom-up approach in its budgeting process. In the context of resource-constrained environments, the strongest driver for innovation in the four researched organizations was the pressures of improved efficiency. As such, leaders of the four organizations tended to prioritize innovation initiatives that could significantly improve efficiency and bottom-up initiatives which were not in line with this move towards more efficiency were more likely to be rejected by the top management.

Since most resource allocation processes tended to take place at the top level of management, the integration between senior leaders and organizational members was focused on obtaining acceptance of senior management's decisions. Top leaders of the four researched organizations tried to explain the rationale of inevitable changes to achieve a shared understanding of the need for and the urgency of such changes. If the changes were imposed by external forces such as government regulations, results show there was least resistance to change. Through continuing and active conversations, areas of difference and agreement were identified and leaders attempted to reconcile them to achieve shared understanding for the pursuit of innovation in the integrating phase. However, some disagreements often could not be avoided. When some members viewed the innovation as disadvantageous to them, they were more likely to oppose its organization-wide implementation regardless of the potential benefits it would bring to the organization. Because collective action was difficult to achieve, the integration process especially for radical changes was introduced in a top down manner, and this was often exercised through the top leaders' power and authority as suggested by Lawrence et al. (2005). Although a relative top-down orientation to learning (particularly in the case of structural reforms at University A and Police Academy A) could result in the integration of behaviors among organizational members, it may not necessarily change the members' thoughts and perceptions, suggesting that the organization's state of learning might be more fragile than it appeared. In the case of University A, those members who did not believe in management initiatives tended to wait for the outcomes to prove the legitimacy of the change or left the

organization. The findings thus indicate that, whether by coercion or by collaboration, the organizations studied achieved a relatively high degree of integration which allowed leaders of these organizations to institutionalize changes in the institutionalizing phase.

8.3.4 Institutionalizing

In the institutionalizing phase, leaders of the researched organizations implemented innovations or lessons learned in organizational systems, structures, procedures, rules and strategy. As shown in Hospital A, top management's leadership and endorsement minimized the inertia in the human capital and administrative systems that hampered the implementation of innovation initiatives, supporting the findings of Wong's (2013) study. In addition, leadership at the middle and operational levels of management across the four organizations also played an important role in institutionalizing innovations by providing support to organizational members when implementing changes. For example, as in the case of Police Academy A, leaders at the different levels of management provided regular communications and encouraged open dialogues with staff regarding the reform process to explain the context of the proposed changes for their business unit. During these dialogues, they also outlined the available support for staff in light of the changing or disbanding of their positions in the future structure of the organization. Communication paved the way for collective interpretation in developing solutions to problems and integrating individuals' knowledge to achieve a common understanding. In the four organizations, this shared understanding would become an avenue for coordinated actions to further institutionalize new innovation initiatives.

As part of the institutionalizing phase, top leaders of the researched organizations incorporated lessons learned into the organization's *strategic* direction. These leaders also set specific guidelines and monitored strategic goal achievement to enhance organizational members' abilities to implement innovative solutions effectively. The leaders assigned responsibilities to organizational members for the implementation of strategic plans, specified performance measures and targets, i.e. Key Performance Indicators, and scheduled the time to complete the task. Changes in the external environment had to be accommodated in the institutionalizing process. Leaders had to adjust strategies when required. For example, interview respondents from Hospital A indicated that leaders would revise the implementation plan if results or performance of an innovation strategy were not as planned. The innovation strategy could potentially loop back to the initiation phase of innovation where new ideas are generated in the intuiting and interpreting phase, followed by the selection process in the integrating phase, and ending with the revision or even renewal of previous strategy in the institutionalizing phase. Leaders of the researched organizations strived to use external reference points (when available) to analyze the organizations' own performance, outputs, and processes. In this way, the leaders set attainable targets which could yet be difficult to achieve in order to motivate individuals and

groups to perform better such that the formal institutionalized system for learning could be challenged or modified to promote new learning.

As discussed earlier, in the context of a resource-constrained environment, leaders of the researched organizations tended to focus on a strategy of cost-leadership or efficiency. However, leaders of the four organizations should not rely on a cost-leadership or efficiency strategy in the long run. While it is understandable that an organization may need to pursue efficiency and short-term financial gains to survive in a resource-constrained environment, these leaders should allow the pursuit of exploratory initiatives with longer-term financial benefits when the tension of resource scarcity is more relaxed. As per Levinthal and March (1993), organizations need to balance exploration and exploitation, with exploitation providing resources for pursuing exploration and conversely exploration enabling the development of new capability to be exploited to avoid rigidity.

In the institutionalizing phase, leaders of the researched organizations also used *structural* arrangements to implement innovation strategy. The researched organizations used distinct structures for different parts of their organizations to respond to differing environmental changes. They tried to have a balanced structure that enabled them to explore and exploit at the same time. Decentralization complemented with high levels of formalization is often preferred to implement innovation and realize opportunities because it provides lower-level leaders more autonomy to make decisions to respond to the environmental changes quickly (Foss, et al., 2015). For instance, as in the case of Bank A and University A, they used a decentralized structure (i.e. Cards teams in Bank A and new course development teams in University A) and provided some level of guidance that provided boundaries for the available options required to support decision making at this level. As such, decentralization complemented with some level of formalizations empowered the organizational members to make necessary adjustments in the institutionalization process. However, in the case of University A and Police A, these organizations also used centralization because it was more effective to implement radical innovation (i.e. structural reform) as it offered management more authority to implement radical changes, similar to the findings of Ettlie et al.'s study (1984). When integration was difficult to achieve, coercion exercised through the top leaders' power and authority which reflected a top-down and centralized approach provided an efficient way to institutionalize radical changes. These leaders also have adopted improved change management processes i.e. better planning and a transition phase for staff to facilitate smooth transition from the previous structures to the new structures. They tried to be more consultative and communicative with the organization's stakeholders in the process of institutionalization to minimize resistance to change.

In addition to the structure, leaders of the researched organizations also tried to institutionalize an organizational *culture* which was conducive for innovation. For example, these leaders

embedded supporting norms and values into organizational cultures i.e. through institutionalization of the "One Team, One Direction" approach at Hospital A. They refined the "Growing the Blue" workshops to enable further institutionalization of the "One Team, One Direction" approach. They strived to foster a knowledge-sharing culture which in turn would lead to creative behaviors and knowledge transfer. Wang and Rafiq (2014) argue that in order to have an innovative supportive culture, organizations need to allow diversified perspectives among their organizational members to encourage creativity but these organizational members also need to have common perspectives in terms of the overall organization vision and direction to promote collaborative behaviors to achieve the organization's goals. As mentioned earlier in the intuiting and interpreting phases, leaders of the researched organizations allowed their organizational members to have different perspectives and encouraged variety of ideas. However, in the integrating and institutionalizing phases, these leaders strived to integrate different views to achieve common understanding and promoted collaborative behaviors to attain the organization's objectives. As such, leaders institutionalized values and norms that encouraged their members to pursue both exploratory and exploitative innovation simultaneously by adjusting the internal organizational context to create an innovative supportive culture. While all leaders of the four organizations have attempted to create a supportive innovation culture, the levels of conduciveness of the organizational culture for innovation were varied across the four cases. It appears that Police Academy A has the least conducive culture or climate for innovation among the four organizations under investigation. The traditional "command and control" culture commonly found in policing organizations negatively influenced a knowledge sharing culture and in turn affected organizational learning for innovation in Police Academy A. It has been difficult to change the traditional "command and control" culture that has prevailed over the years and it is only in recent times with the reform and the introduction of initiatives like the Frontline Innovation Portal that there has been encouragement for innovation.

In the institutionalizing phase, leaders of the researched organizations provided the necessary resources in the implementation and institutionalization of new innovation initiatives because the innovations often required additional *resources*. In terms of human resources, inadequate management skills in providing consistent and systematic implementation can prevent an organization-wide institutionalization and adoption of innovation (Schilling & Kluge, 2009). One of interview respondents from University A explicitly mentioned project management skills as necessary skills in the process of institutionalization. As such, leaders needed to provide adequate training in project management to implement innovative ideas. Since organizational members were unfamiliar with the innovation, adequate and relevant training other than project management was also required to institutionalize the innovation in order to ensure successful implementation. The researched organizations also needed to collaborate with

external partners to implement the innovation because they often did not have the knowledge and skills internally. For example, Hospital A collaborated with external partners to provide relevant training related to the adoption of new medical technology.

The institutionalized knowledge also influences the dynamic tension between exploitation of existing knowledge and exploration of new knowledge. Across the four cases, it appears that existing knowledge and technologies put limitations on the range of new technological-based innovation. Therefore, leaders of the researched organizations strived to institutionalize new knowledge in such a way that enabled the organization to pursue both exploitation and exploration in the future. In terms of technology, leaders strived to invest in technology infrastructure that could support the future strategic agility. For example, both Bank A and University A invested in cloud computing. While University A moved its entire data center to an external cloud provider to improve efficiency and flexibility, Bank A only used external cloud service providers for less confidential or sensitive data due to data security concerns.

8.4 Conclusion

It is revealed from the multiple-case study that the researched organizations tended to pursue higher exploitative learning coupled with lower exploratory learning in a resource-constrained environment. This reflects the findings from previous literature that a focus on managing trade-offs between exploration and exploitation is more beneficial to resource-constrained organizations (Q. Cao, et al., 2009; Gupta, et al., 2006; March, 1991). The resource constraints brought about by slow economic growth in Australia after the global financial crisis (GFC) impeded the four organizations from pursuing high exploration and high exploitation. The subdued economic growth also has had the impact of intensifying domestic competition in the private sectors. Public institutions experienced a significant reduction in government funding. During this resource-constrained period, the researched organizations faced financial and other resource-related problems. For instance, financial problems in the innovation process involved insufficient funds for innovation projects, excessive costs of technology investment, and uncertain investments in innovation activities. These often caused leaders of the researched organizations to avoid high-cost and high-risk innovation. These leaders were also more likely to guide innovation activities towards the improvement of efficiency. In addition, the researched organizations often had to innovate using available resources at hand as they did not have sufficient funds to acquire new expensive technology. Meanwhile, other resource problems in these organizations were usually characterized by scarcity of materials (such as technology infrastructure) and lack of know-how and capabilities. These problems often required the researched organizations to prioritize their technological investments carefully due to limited resources and to collaborate with external innovation partners, such as suppliers and consultants.

From the perspective of resource scarcity, the four researched organizations have tried to balance the relative levels of exploration and exploitation dynamically to distribute scarce resources optimally as suggested by March (1991). While the researched organizations had to survive in the short-run by pursuing mostly exploitative learning in the face of the resource-constrained period, they were also required to consider long-term sustainable growth by pursuing exploratory learning. In the longer term the researched organizations should balance exploitation and exploration, with exploitation providing resources for pursuing exploration and conversely exploration enabling the development of new capability to be exploited to avoid rigidity as suggested by Levinthal and March (1993). It appears that the four researched organizations are more likely to pursue sequential ambidexterity if observed using a longitudinal study. Geerts et al. (2010) in a study of ambidexterity over time found that service organizations preferred sequential to simultaneous ambidexterity when environmental pressures were relatively low. They suggest that these organizations tended to focus on increasing efficiency in the service delivery and were more likely to invest in radically new capabilities only when an opportunity or certain need emerged. In the contexts of the four researched organizations where the markets were relatively regulated, sequential ambidexterity might be more useful since O'Reilly and Tushman (2013) argue that this approach is more suitable in stable and slower moving environments. As shown in the case of Hospital A, while the strategy between 2009 and 2013 was to pursue redevelopment initiatives, the strategy in the following years has changed to achieve operational efficiency through mostly exploitation activities to enable the hospital to gain financial benefits from its new facilities. Although this research is not a longitudinal study, the sequential ambidexterity in the hospital could be captured because the hospital was about to renew its overall strategy during the time this study was undertaken.

While the demand for new products was relatively stable for the researched organizations, technology development was growing rapidly and in turn affected how service products were delivered (e.g. online banking and online learning). In addition, the high pressures of increased efficiency in the context of a resource-constrained environment have forced the researched organizations to adopt new technological-based innovation. As such, for the researched organizations, exploration did not only mean product differentiation but also related to significant or radical business process improvements. The significant changes of the underlying technologies in the product and production processes required these organizations to redefine their existing competencies and in turn led to exploration as suggested by Floyd and Lane (2000). However, legacy systems tended to impede the adoption of new technology in all researched organizations. As such, these organizations strived to invest in technology infrastructure that could support future strategic agility. In other words, they invested in technology that could meet current and future business requirements. As recommended by Birkinshaw and Gupta (2013), these organizations should also pursue new technology that

enables the introduction of new services with high efficiency and high differentiated value to the customer.

As previously mentioned, all the researched organizations strived to adopt strategic flexibility by pursuing both cost-leadership and differentiation strategies simultaneously in order to face an ever-changing environment as suggested by Santos-Vijande et al. (2012). The four organizations strived to achieve higher efficiency to survive in a resource-constrained environment and pursued technological-based innovation that could offer cost savings. While the researched organizations pursued mostly efficiency or exploitative innovation, they did have some exploratory innovation in terms of product differentiation. For example, Bank A had a few new financial product innovations and University A introduced some new courses. These organizations tended to upgrade or recombine existing products to develop customized solutions targeted for new customer groups rather than developing a totally new product. In this way, they explored new marketing processes but exploited existing capabilities and technologies in the product-related and operational activities. In addition, two of the researched organizations (University A and Police Academy A) undertook major structural reform to streamline their business processes and this could be associated with exploration given the scale of the changes it introduced.

To enable the simultaneous pursuit of both exploration and exploitation, the four researched organizations adopted structural and contextual approaches to ambidexterity. They used a structural separation approach to provide space and resources to enable initiation of new ideas. To complement this structural separation, the researched organizations also adopted a contextual approach to enhance the integration between exploration and exploitation activities at the individual level (i.e. allowing individuals to both explore and exploit). The pursuit of a contextual approach alone is not practical and tends to promote more incremental changes because it will be the senior management who make decisions about significant resource allocation and not individual organization members (O'Reilly III & Tushman, 2013). In other words, while individual members can have fantastic exploratory ideas, these ideas still need to be approved at the organizational level by the senior management if they are to be implemented.

In addition, Kauppila (2010) argues that organizations should use both intra-organizational and inter-organizational approaches to enhance its ability to explore and exploit simultaneously. This study also shows that the researched organizations have tried to create ambidexterity by collaborating with external strategic partners (i.e. suppliers, consultants, and universities). For example, all the researched organizations tended to work with external partners to deliver both technological-based innovation and administrative innovation because these partners could provide new knowledge in terms of best practices and cutting-edge technologies and practices. In the case of Police Academy A, it relied on its external partners to explore new technology

since its staff were more knowledgeable in the policing areas than in technology. However, the researched organizations have not been able to develop long-term mutual relationships that enable them to pursue more explorations.

While "open innovation" in radically shifted information and communication contexts has been increasing significantly, innovations in the four organizations in this study still took place within the firm boundaries and/or were conducted with selected external partners (e.g. suppliers, consultants, and universities). Since the knowledge to both create a range of solutions and select among these solutions was relatively concentrated within the organization, the four researched organizations preferred traditional closed innovation processes to open innovation processes as suggested by Benner and Tushman (2015). However, there is a tendency that the tasks for delivering service are become more modular (or decomposable) and problem-solving knowledge is more disperse than ever before (Benner & Tushman, 2015; Lakhani, Lifshitz-Assaf, & Tushman, 2013) and as such the four researched organizations should engage more with external communities in more open and collaborative relations (e.g. collaborative research among academics from different universities worldwide in the case of University A).

The existing theoretical framework suggests that the innovation process involves idea generation and idea implementation which can also be associated with exploration and exploitation. Exploration of new knowledge during the idea generation phase stresses the intuiting and interpreting phase of 4I organizational learning. From the multiple-case study, it is found that leaders strived to promote new ideas by being open and tolerant of some degree of risk-taking behaviors among organization members. They also communicated an inspiring vision or aspiration that motivated their members to think of new ways of doing things. They facilitated formal and informal meetings among organization members to allow them to interact and share knowledge that stimulated the development of new ideas. To mitigate the limitation of hierarchical communication channel structures and promote bottom-up learning for exploring new ideas, leaders at researched organizations provided more mechanisms to collect bottom-line insights or initiatives, such as "Innovation Days" or the "Frontline Innovation Portal". In addition, they tried to flatten bureaucracy and reduce formalization to encourage more exploratory ideas. Once leaders obtained a variety of ideas or initiatives from members across the whole organizations, they would evaluate and select the most promising initiatives in the integrating phase of 4I organizational learning. Leaders' role in integrating new learning and existing knowledge was critical in determining whether the ideas would lead to exploratory or exploitative innovation at the four organizations. It was when leaders were able to clearly identify the benefits of exploratory ideas and were able to provide the required resources, that these ideas were pursued e.g. the adoption of mobile banking at Bank A.

Leaders at the researched organizations often faced intensified tension between exploration of new learning and exploitation of existing knowledge in the phase of integrating. They were required to prioritize innovation projects since their organization had limited resources. Sirmon et al. (2011) argue that the optimal relative level of exploration and exploitation may depend on an organization's capabilities in managing its resources. In line with this thought, the optimal relative level of exploration and exploitation in the four researched organizations tended to vary due to industry and firm-specific contexts. For example, the tendency for focusing on efficiency or exploitation was higher among the public organizations (University A and Police Academy A) compared to their private counterparts due to high influence of the government's funding on budget structures. Conversely, the competitive pressure for product differentiation or exploration was higher in private (particularly Bank A) than public organizations.

In the institutionalizing phase, leaders of the four researched organizations made the necessary arrangements to implement new ideas, involving higher levels of formalization to enable the transformation of a vague idea into a specific innovation projects. They also disseminated institutionalized learning through various mechanisms, such as broadcast emails, portals, and meetings. As communication was the key for achieving mutual understanding, in the institutionalizing process, leaders of the researched organizations strived to develop two-way communications with organizational members to identify unforeseeable problems or barriers for implementation and worked collectively to solve these problems. The leaders also conducted relevant training to ensure successful implementation of new innovation initiatives.

Since the institutionalized knowledge can provide the basis for further intuition, leaders of the researched organizations strived to institutionalize new knowledge in such ways that enabled the organization to explore and exploit simultaneously. The institutionalized knowledge influences the dynamic tension between exploitation of existing knowledge and exploration of new knowledge (Lengnick-Hall & Inocencio-Gray, 2013). The embedded knowledge often limits the organizations' ability to recognize the value of unfamiliar learning and in turn contributes to the organization's inertia (Levinthal & March, 1993). In this way, organization tends to exploit what they have understood because the outcomes are more predictable and visible in the short term (March, 1991). Across the four cases, the evaluation of the success of innovation strategy could trigger new intuiting to come up with new ways of doing things and lead to feed-forward learning when the results or performance of an innovation strategy were not as planned. Leaders of the researched organizations used external references (when available) to benchmark performance and in this way they set attainable targets which could be difficult to achieve in order to motivate individuals and groups to perform better such that the formal institutionalized system for learning could be challenged or modified to promote new learning. The uses of performance measures that can direct managers' attention to longer-term consequences of their

strategic actions are also required to stimulate the intuition of exploratory innovation as suggested by Grafton et al. (2010).

While the 4I model above could provide general understanding of organizational learning process, the reality of the organizational learning process is far more complex than its theoretical description. Empirical findings in this study show that the sub-processes of organizational learning can occur simultaneously in which some innovation initiatives were already in the phase of institutionalizing but other initiatives were still in the phases of intuiting and interpreting or in the stage of integrating. For example, while some managers were engaged in refinement or exploitation of existing service products, other managers were at the same time exploring new opportunities and developing new service products. As such, the learning processes involved different and conflicting managerial behaviors. The intuiting and interpreting of new products may be impeded by the institutionalizing of existing products. For example, the exploration of new courses at University A was hindered by the refinement or exploitation of existing related courses and this led to tension between these two conflicting activities. In addition, the transition between phases was not so clear cut so that what leaders needed to do to facilitate organizational learning in each 4I phase sometimes overlapped. For instance, cross-functional meetings facilitated collective interpreting required for idea generation which stimulated intuition. Cross-functional meetings also facilitated collective interpreting to provide insights for developing solutions to problems and integrating individuals' knowledge to achieve a common understanding during the implementation of ideas. This shared understanding would then enable coordinated actions to further institutionalize these ideas. Furthermore, the dynamic of managing the tension between exploration and exploitation is so complex, which requires managers to understand the situational context and at the same time demonstrate the capability to effectively adjust the internal contexts to the demands of the external environment (Almahendra & Ambos, 2015).

Chapter 9: Contributions, limitations and future research

9.1   Contributions to theory and practice

Research has suggested that organizations need to pursue both exploratory and exploitative learning simultaneously, termed as ambidexterity, to achieve exploratory and exploitative innovation and in turn sustained performance. An overemphasis on exploitation can harm the capability of an organization in building new competencies or modifying existing competencies to respond to the changing business requirements. On the contrary, an overemphasis on exploration can lead to the possibility that the organization will keep searching but is unable to reap the potential benefits from its previous learning. Senior leaders play an important role in managing exploration and exploitation and in resolving conflicts that arise from competition of scarce resources to pursue these two activities. Achieving organizational ambidexterity is particularly important for large service organizations because they need to continuously explore new approaches to provide better services for their customers but large organizations often find it difficult to explore new learning due to their complexity of structures and bureaucracies. This exploratory study provides further insights into the nature of specific resource-constrained situations that drive organizational leaders in Australian large service organizations to engage in both exploratory and exploitative innovation and how they pursue these two types of innovation through organizational learning.

This thesis shows that the orchestration of exploration and exploitation is a complex phenomenon because of the complex interrelationships between external and internal contexts in influencing both exploratory and exploitative learning for innovation. How senior leaders perceive the external environments (i.e. competition, customer demands, development of technology, strategic partners, and regulatory environments) affects the extent of innovation (exploratory and exploitative innovation) the organizations pursue. As such, external forces may drive organizational leaders to formulate innovation strategies and facilitate organizational learning for innovation by controlling or adjusting the internal context (comprising elements such as strategy, structure, organizational culture, and organizational resources).

This study makes the following contributions in terms of theoretical and practical implications. First, this study provides empirical evidence of how external and internal contexts can affect the simultaneous pursuit of exploration and exploitation. While ideally organizations are supposed to be able to pursue high exploration and high exploitation simultaneously, a resource-constrained environment characterized by increased competition particularly for the private

sector and significant budget reductions for the public sector is more likely to force organizations to pursue higher exploitation coupled with lower exploration. In a resource-constrained environment, leaders of the researched organizations tended to focus on efficiency or a cost-leadership (exploitation) strategy than on a differentiation (exploration) strategy. In this way, this study also contributes to expanding our understanding of the link between exploratory and exploitative learning and the strategy of the firm (i.e. cost-leadership and differentiation). Senior leaders of the researched organizations formulated and communicated strategic vision and priorities to inspire their members to pursue innovation aimed at increasing efficiency. While this study shows that the researched organizations tend to pursue high exploitation during a resource-constrained period, the study also demonstrates how organizational leaders promote exploration in this type of environment in order to achieve ambidexterity. Interestingly, the findings of this study show that exploitation and exploration in a resource-constrained environment cannot be strictly categorized in terms of efficiency and product differentiation. Exploration for the researched organizations could also mean radical process improvements aimed at increasing efficiency and was not limited to product differentiation. For example, they pursued exploratory innovations aimed at achieving higher efficiency, such as administration innovation like structural reforms to streamline business processes and the adoption of technological-based innovation that resulted in significant cost-saving. Since these organizations could not compete or survive merely based on cost efficiencies, they also strived to differentiate their services. They tried to produce customized or niche products by upgrading or recombining existing capabilities to target new customer groups. Although Police Academy A was not in the competitive market, it also differentiated its services through the provision of updated education and training that enabled frontline officers to provide more focused and efficient policing services. As such, the researched organizations strived to pursue both cost-leadership or (efficiency) and differentiation strategies simultaneously to achieve flexibility in order to respond to ever-changing business environments as suggested by Santos-Vijande et al. (2012).However, the optimal level of efficiency and differentiation was different across the four cases due to contextual differences.

Geerts et al. (2010) found that service organizations preferred sequential to simultaneous ambidexterity where the organizations tended to focus on increasing efficiency in service delivery and were more likely to invest in radically new capability only when an opportunity emerged. However, while the demand for new products was relatively stable for the researched organizations, technology development was growing rapidly and in turn significantly affected how service products were delivered (e.g. online banking, online learning, and robotic surgery). The significant changes of the underlying technologies in the product and production processes required these organizations to redefine their existing competencies and in turn led to exploration of new knowledge as suggested by Floyd and Lane (2000). However, legacy

systems and inadequate human resource capabilities could impede the adoption of new technology in the researched organizations. As such, these organizations had to invest in technology and human resources that could meet current and future business requirements and this required them to pursue a simultaneous approach to ambidexterity i.e. pursuing both exploration and exploitation.

The second contribution this study makes is that it offers further insights into **how** organizational leaders achieve a simultaneous approach to ambidexterity. Leaders need to be able to foster both exploration of new knowledge and exploitation of existing knowledge in order to innovate (e.g. Rosing, et al., 2011; Vera & Crossan, 2004). In line with this thought, leaders of the researched organizations encouraged their members to think in new directions and challenge institutionalized learning to promote more varieties of new exploratory ideas in the initiation phase of innovation. Conversely, these leaders narrowed innovation initiatives (through prioritization and integration of different views) and reinforced institutionalized learning in the implementation of the innovation process. Leaders can facilitate these learning processes in an organization through the development of a learning culture and human resource practices as suggested by Berson et al. (2006). An organization's efforts to facilitate organizational learning through human resource management practices can be associated with a contextual ambidexterity because it assumes that as a whole the ambidexterity of an organization can result from specific actions of individuals (Kang & Snell, 2009). Leaders of the researched organizations have adopted contextual ambidexterity through the implementation of human resource practices (e.g. reward structures, more delegated decision-making, cross-functional teams etc.) that encouraged individuals to pursue both exploratory and exploitative learning.

However, the findings of this study demonstrate that the pursuit of a contextual approach alone is not adequate to promote radical changes, supporting the proposal of O'Reilly III and Tushman (2013). While individual members can have fantastic exploratory ideas, the decisions about significant resource allocation are made by senior management and not individual organization members. Interview respondents indicated that senior leaders would only support radical bottom-up ideas as long as these ideas did not require additional resources or could be implemented using available resources at hand. As such, the researched organizations also used a structural approach to provide space and resources to enable initiation of new exploratory ideas. The establishment of dedicated units for exploration (e.g. the Segment Business Development team in the case of Bank A) could also develop appropriate contexts for exploration in particular areas as dictated by the organization's strategic priorities. In this way, this study contributes to expanding our understanding of the complementariness of contextual and structural ambidexterity.

Lastly, this study offers a better understanding of the innovation process through an extension of the 4I organizational learning lens to include the elements of the external and internal contexts of an organization on organizational learning for innovation. The process of exploratory innovation requires relatively high exploratory learning in the phase of idea generation and needs relatively high exploitative learning in the phase of idea implementation. Leaders across the four cases provided internal contextual support to facilitate both exploratory and exploitative learning for innovation. These leaders adjusted the internal context (i.e. strategy, structure, organizational culture, and organizational resources) in response to ever-changing external challenges. This study expands Berson et al.'s (2006) framework on how leaders provide internal contextual support to facilitate organizational learning for innovation in each of Crossan et al.'s (1999) 4I learning phases by incorporating the role of internal and external context.

This study also provides empirical evidence based on data collected from service firms that provide practical benefits to practitioners. The first practical implication is how actually managers can provide internal contextual support to facilitate organizational learning for innovation. The role of leadership is essential in stimulating organization members' creativity in the phase of idea generation which can be closely associated with the intuiting and interpreting phase of 4I organizational learning. The exploration of new ideas in the intuiting and interpreting stage of 4I organizational learning required senior leaders in the researched organizations to promote relatively high exploratory learning by communicating an inspiring vision and strategy to encourage their members to find novel solutions. They provided more mechanisms for bottom-up knowledge inflows (such as "Innovation Days" and "Frontline Innovation Portal") beyond the formal hierarchical channel, to collect more variety of ideas. In addition, these leaders adopted a structural ambidexterity approach by establishing dedicated innovation functions to promote exploration in particular areas. The separation of "exploratory and exploitative" units was required to ensure the allocation of resources for both exploration and exploitation activities. The leaders also facilitated formal and informal cross-functional meetings to enable their members to interact, share knowledge and collaborate on innovation projects. These leaders tried to achieve contextual ambidexterity by creating a culture that allowed organizational members to respect different perspectives. This is particularly important in the initiation phase of innovation to promote a variety of innovative ideas from different sources within the organization. Financial constraints and legacy systems were commonly found as inhibitors for the adoption of technological-based innovation. Although the researched organizations also faced the issue of insufficient human resource capabilities for innovation activities, they minimized these problems by collaborating with external innovation partners, such as suppliers, universities, and external consultants. When organizational members engaged in greater exploratory learning in the initiation phase, they would be more likely to come up with exploratory innovation. In this way, this study contributes to provide empirical evidence

and practical guidance on how leaders influence individual organizational members' creativity through the creation of a conducive working environment for innovation, which included decentralization and delegated decision-making in some areas.

In the integrating phase of 4I organizational learning, leaders at the researched organizations were required to be ambidextrous, integrating new knowledge and existing knowledge. They had to evaluate and select the most promising initiatives that could best meet the organizations' goals. Since the researched organizations had limited resources, senior leaders had to make trade-offs in selecting new initiatives and often prioritized new initiatives aimed at achieving higher efficiency, particularly in the resource-constrained environment. To enhance the organization's capability in making strategic allocation decisions, the researched organizations had a set of criteria to help senior leaders prioritize initiatives (e.g. "Enterprise Resource Allocation Model" in the case of University A). These organizations also had formal regular leadership team meetings at the executive levels to allow senior leaders to discuss and debate conflicting demands of exploration and exploitation which in turn enabled them to evaluate and reconfigure potential combinations of knowledge sources at separated "exploratory and exploitative" units. The researched organizations also had cross-functional teams working on innovation projects to promote lateral knowledge flow across units and in turn help the integration of exploratory and exploitative activities at lower levels of management. As part of an effort to create an ambidextrous culture, leaders of the researched organizations also communicated a shared vision to integrate different views and encourage organizational members to work collectively to achieve the organization's goals. In this way, this study tries to provide further insights on how leaders guide the integration of new and existing knowledge by facilitating a shared understanding at both the group and organizational level to allow for coherent and collective actions.

During the institutionalizing phase of 4I organizational learning, leaders at the researched organizations were required to make knowledge available for exploitation. They made necessary arrangements to implement new initiatives that involved changes in systems, structure, procedures, and strategy. Leaders at different levels of management guided the institutionalization of new and existing knowledge, often using centralization or tighter control during this phase of the 4I process. These leaders set specific guidelines and monitored strategic goal achievement to enhance organizational members' abilities to implement innovative solutions effectively. Most importantly, leaders at the researched organizations strived to institutionalize new knowledge that enabled their organizations to continuously pursue both exploratory and exploitative learning in the future. One of the examples is adopting new IT capability that provides flexibility to meet existing and future business requirements (e.g. cloud computing in the case of Bank A and University A). In addition, leaders of the researched organizations strived to use external reference points to analyze the organizations' own

performance, outputs, and processes. By doing so, these leaders would be able to set attainable targets which could yet be difficult to achieve in order to motivate individuals and groups to perform better such that formal institutionalized systems for learning could be challenged or modified to promote new learning. These leaders also provided adequate and relevant training to institutionalize innovation in order to ensure successful implementation.

The second practical implication is that managers need to be proactive and flexible in managing the technology infrastructure and human resources in response to changes in the external environment as the environment becomes more dynamic due to the advancement of technology. The investment in a particular technology platform could affect the future technological capabilities that could be developed to support innovation and influence the organization's knowledge requirements for exploiting the technologies. In addition, knowledge and skills to adopt new technology and innovation are constantly changing. This study offers practical guidance on how leaders facilitate the organization-wide implementation and adoption of innovation as well as institutionalize new knowledge in such a way that enables the simultaneous pursuit of exploration and exploitation.

Lastly, managers can pursue a simultaneous approach to ambidexterity to achieve this flexibility. While there is a tendency for organizations to focus on efficiency during the resource-constrained period, they can pursue exploration by improving business process significantly through restructuring and the adoption of technological innovation as clearly shown in the case of University A and Police Academy A.

9.2   Limitations and future research

An acknowledgement of limitations to the study and recommendations for future research are discussed as follows:

- The analysis of previous chapters shows that organizations can still pursue exploratory innovation in a resource-constrained environment by managing their resources in such a way as to optimize their exploratory learning. However, leaders or managers should contextualize the lessons learnt from this research to fit their organization-specific contexts. The importance of various external and internal forces may vary within different industrial sectors, among firms within the same industrial sectors, and over time within the same organization. As a result, certain situations may require different approaches with distinct configurations to support both exploratory and exploitative learning for innovation. Future research could focus on one industry or cross-industry with larger number of organizations to obtain deeper understanding of the effects of industry-specific contexts on the process of innovation and ambidexterity. Another recommendation for future research is cross-country research to determine the

importance of issues like culture and regulatory environments on the process of ambidexterity and innovation.

- This research collected information mostly from top and middle managerial levels. How top leaders perceive the need for change and what kind of change they think is appropriate may be affected by the perception of middle managers of the situation. However, how middle managers interpret the situation may not be consistent with the perception of those at the operating level and thus middle managers may fail to channel up the most promising initiatives to top management. Therefore, future research may need to consider including more participants from operating levels to better understand the gap between top management and the perception of those at the operating level and how this affects the process of feed-forward learning within 4I organizational learning.

- Acknowledging the complexities that are inherent in the process of innovation and ambidexterity, research in this area would benefit from concentrating on the temporal aspect using longitudinal data collection over relatively long periods to comprehend better the process of innovation and ambidexterity that unfold over time. However, the relatively short time limit of this study did not allow the researcher to do that. Future research can commence where this study concludes by investigating the pursuit of innovation by the four organizations over time.

- A broader approach can be taken in considering the benefits of organizational learning ambidexterity on innovation and in turn competitive advantage. Innovation can lead to superior performance providing slack resources that can be invested in future innovation to sustain competitive advantage. However, inappropriate investments may also impede innovation resulting in future performance declines. Future research may look further at the detailed operational mechanisms and linkages between ambidextrous innovation and financial performance.

- Since the organizational learning process for innovation in an organization is bounded by its context, the investigation of the interplay of all external and internal factors as a whole in influencing this learning process is critical in understanding the complexity of the process. Exploring four large service organizations in different industries or sectors could highlight the contextual differences (particularly external contexts) among the researched organizations. How the ambidexterity challenge could be handled may be dependent upon the industry. For example, public institutions have high reliance on the government funding framework that can influence the pursuit of exploration and exploitation. Interestingly, exploration for these public institutions could mean mostly significant business process improvements and may not be confined to product differentiation only. Conversely, private institutions like Bank A with no public contracts could have more exploration in terms of product differentiation since the pressures for product innovation was higher than its public counterparts. Nevertheless,

the choice of four different sectors does not enable the clear observation of the strategic importance of a particular common innovation in response to external challenges. To do so, would have required observation of all major players in the same sector exposed to similar strategic constraints. Further research can look at how the pursuit of innovation can affect performance differences among organizations in the same sector facing similar external challenges.

- The findings of this study showed that the use of formalized risk identification in the researched organizations could promote bottom-up initiatives or feed-forward learning as staff at all levels were asked to identify risks and in turn they tried to find ways to mitigate the risks which might involve innovation initiatives. However, risk is also often seen as reasons for not doing something which in turn can hinder the pursuit of innovation. As such, future research can investigate how a risk culture influences organizational learning for innovation.

- There has been a tendency that tasks for delivering service have become more modular and problem-solving knowledge is more disperse than ever before. This has required organizations to pursue "open innovation" by engaging more with external communities in more open and collaborative relations. However, innovations in the four organizations still took place within the firm boundaries and the pursuit undertaken with selected external partners. Future research can explore how large service organizations can be more active in pursuing "open innovation" and to what extent "open innovation" will be beneficial for them.

- This research was predominantly drawn on publicly available documents and interviews from a few respondents in very large organizations which may limit the generalizability of the study.

- Because the matters covered in this study (many variables of both external and internal contexts) are quite wide-ranging, the researcher has had to make a trade-off between the breath and the depth of the discussion considering the limitation of time and resources for doing the study. This is an exploratory study and therefore the complex interrelationships among variables can be investigated in more depth in future research.

- In the intuiting and interpreting phases, leaders try to stimulate their members' creativity in order to increase variety of new innovative ideas. In the management area, there is a growing interest to study "design thinking" as it is often associated with how to be creative and innovate (Johansson-Skoldberg, Woodilla, & Cetinkaya, 2013). Therefore, it can be useful to connect organizational learning at the individual level with existing practical innovation approach, such as design thinking.

- While the literature review has partially mentioned the role of different level leaders in the learning process, future research may further examine different roles of leaders at various levels of management in facilitating organizational learning for innovation.

- A future direction in research could also be to examine the 4I model vis-à-vis innovation in non-service organizations and compare that with the findings of this research.

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Appendix 1 Publications and presentations arising from this thesis

Fahrudi, A., Gengatharen, D., Suseno, Y., Standing, C., (2013), Contextual support for innovation in an Australian financial services firm. *The Proceedings of the 6th ISPIM Innovation Symposium*, 15, Melbourne, Australia.

Fahrudi, A., Gengatharen, D., Suseno, Y., (2016), Administrative innovation in an Australian public university. *Proceedings of ECU Business Doctoral and Emerging Scholars Colloquium*, 12-20, Perth, Australia.

Fahrudi, A., Gengatharen, D., Suseno, Y., (2017), Managing organizational learning ambidexterity in a resource-constrained environment: an exploratory study of Australian large service organizations. *The Proceedings of the XXVIII ISPIM Innovation Conference*, 14, Vienna, Austria.

Fahrudi, A., Gengatharen, D., Suseno, Y., (2017), Organizational learning for innovation in an Australian hospital. *Proceedings of 2nd ECU Business Doctoral and Emerging Scholars Conference*, 14-26, Perth, Australia.

Appendix 2 Interview guide

I. **Introduction**

The interviewer provides the overview of the study and gives the definition of innovation for the purpose of this study.

Definition of innovation

Innovation is the implementation of a new or significantly improved product (service), or method related to either organization's productive systems or management systems. It can still be considered as an innovation as long as it is new to your organization although it may not be considered as new somewhere else.

II. **General information of an interviewee**

- What was your professional background before coming to this organization?
- How long have you been with this organization and in what capacities?

III. **Historical perspective on innovation (general)**

- Can you give us your perspective on the innovations and/or changes this organization has undergone over the last 3 years?

IV. **External contexts**

- What are external factors that could drive your organization to change? (in terms of competition, customer demands, technological development, strategic partners, and regulatory environments)

V. **Internal contexts**

- What are internal factors that could drive your organization to change?
- To what extent do your leaders support innovation and/or changes? (How do your leaders encourage new ideas and implement these ideas?)
- What are the conditions within your organization that potentially facilitate/hinder the interaction and collaboration among organizational members?

VI. **Four I's**

- Whose insight drives the changes?
- How are decisions made and action taken?
- What are some of the tensions in making these decisions?
- How is conflict resolved?
- How are the decisions tied into the resource allocation process?
- How are the decisions tied into strategy?
- How do the investments in systems, structures and assets, facilitate/impede change?

VII. **Future**

- Can you predict major challenges for your organization in the future and recommend some alternative solutions for the enterprise as a whole? Please describe them.

VIII. <u>Wrap-up</u>

- Are there other areas that we have not covered that you feel are important in relation to innovation in your organization?

Appendix 3 Information letter

INFORMATION LETTER TO PARTICIPANTS

As a member of an innovative organization, you are invited to participate in this research project, which is being conducted as part of the requirements of a PhD at Edith Cowan University, Australia. The details of the researchers for this research project are as follows:

Agung N.L.I Fahrudi (Researcher/ Chief Investigator). Email: afahrudi@our.ecu.edu.au
Denise Gengatharen (Principal Supervisor). Email: d.gengatharen@ecu.edu.au
Yuliani Suseno (Associate Supervisor). Email: y.suseno@ecu.edu.au

The purpose of the project is to investigate how an organization undertakes its learning in order to be innovative. This research will attempt to identify the significant factors that influence the process of innovation. Innovation is the implementation of a new or significantly improved product (good or service), or method related to either an organization's productive systems or management systems.

If you choose to participate in this project you will be asked to participate in a face to face interview for up to an hour. During the interview, notes will be taken and the interview will be audio-recorded. The audio recording of the interview will be erased once the project is completed. No risks or discomfort to yourself are anticipated during the interview but you may choose not to answer some of the questions if you wish. Should the need arise; you may be contacted for further clarification after the interview is transcribed. I anticipate that the further clarification should take no longer than 15 minutes.

The information will be used to complete the requirements for the research project noted above, and only the researcher will have access to any individual's information. Any information or details given for this study will be kept confidential and will be used for the purposes of this project and may be used in related future projects. Your name will not be identified by name/institution in any written report or presentation of the result of this project unless you approve.

Participation in this project is voluntary. If you decide to participate, you are free to withdraw from further participation at any time without giving a reason and there will no consequences. After the project is completed, you can ask for a written report.

If you have any questions or require further information about the research project, please contact:

Agung N.L.I Fahrudi
School of Business and Law
Edith Cowan University
Tel: (61 8) 6304 2183
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Appendix 4 Consent form

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INFORMED CONSENT DOCUMENT

MANAGING ORGANIZATIONAL LEARNING AMBIDEXTERITY IN A RESOURCE-CONSTRAINED ENVIRONMENT: AN EXPLORATORY STUDY OF AUSTRALIAN LARGE SERVICE ORGANIZATIONS

</div>

Agung N.L.I Fahrudi (Researcher/ Chief Investigator). Email: afahrudi@our.ecu.edu.au
Denise Gengatharen (Principal Supervisor). Email: d.gengatharen@ecu.edu.au
Yuliani Suseno (Associate Supervisor). Email: y.suseno@ecu.edu.au
School of Business and Law, Edith Cowan University, Australia

I have been provided with a copy of the Information Letter that explains the project clearly.
I have been given the opportunity to ask questions and these have been answered to my satisfaction.

I understand that being a participant in the research project will involve a face-to-face interview for an hour that will be audio recorded. Moreover, I also understand that the audio recording will be erased at the completion of the project and I may be contacted for further clarification if the need arises once the interview is transcribed (this should not take more than 15 minutes).

I understand that the information provided will be kept confidential and will be used for the purposes of this project and may be used in future projects. I also understand that I will be identified/not be identified (*choose one option*) by name/institution (*choose one option*) in any written report or presentation of the results of this project. In addition, I am free to withdraw from further participation at any time, without explanation or penalty. If I wish, I can ask for a written report when the project is completed.

I freely agree to participate in the project

Date   ....

Signature

Name   ....