



University of Technology Sydney

Building Management Innovation Capability in Large Rail Organisations

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Certificate of Original Authorship

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Abstract

Innovation is the implementation of a new or significantly improved product, service, process or marketing method, or a new organisational method in business practices. Management innovation, which has recently emerged in contemporary scholarship as a new type of innovation, refers to the invention and implementation of a change to management practice, processes, structures or techniques that are new to the state of the art and help achieve organisational goals.

The innovation capacity of public service organisations is under-researched particularly in the area of management innovation. Lack of innovation in public sector rail organisations in particular is attributed to a risk averse culture, regulatory red tape, cost cuts, change resistance, bureaucratic barriers, safety as the key focus, inadequate funding for innovation and cultural barriers to innovation. To address this gap, this thesis investigates how to develop management innovation capability to improve rail organisation performance and provide better rail services to customers.

Implementing management innovation requires multiple capabilities which are discussed in leadership and organisational theories. However, the innovation capabilities in these theories overlap in various stages of innovation which makes the practical application of management innovation difficult. Alignment of capabilities to various stages of management innovation can enable large rail organisations to understand and build capabilities to initiate and implement management innovation.

This research focused on how to build management innovation capabilities in large rail organisations in Australia using a mixed methodology of qualitative and quantitative research. A theoretical model for a Management Innovation Capability Framework was developed and three case studies in safety, maintenance and customer service were selected, with one from each of the participating large rail organisations in Sydney, Melbourne and Brisbane. The case studies were eliminating level crossing incidents, establishing a centre of excellence in rail maintenance and introducing a customer service model. Semi-structured in-depth interviews were conducted with 36 executives, general managers and senior managers to understand the management innovation capabilities in the case studies, followed by quantitative survey research

with 70 participants, mostly executives and general managers, in the three participating organisations.

The research started with three sets of capabilities including driving, developing and diffusing capabilities aligning with an input, process and output model. However findings from the three case studies suggested that five sets of capabilities including discovering, driving, developing, deploying and diffusing capabilities are a better model to assist large rail organisations at various stages of management innovation from initiation to implementation. Descriptive analysis and confirmatory analysis using structural equation modelling were conducted to validate the research model.

Aligning these stages into a framework, the research provides theoretical and empirical underpinning for the application of the Management Innovation Capability Framework to large Australian rail organisations. The Management Innovation Capability Framework can help not only managers in large rail organisations but also managers in any other similar large complex public sector organisations to understand the enabling capabilities required for each stage of management innovation, and to successfully implement and maintain a management innovation program to resolve major problems and to realise significant opportunities.

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1 Management Innovation in Rail Organisations

1.1 Introduction

This chapter establishes the context for the research: it introduces the thesis topic, provides background information on the theoretical and academic context and establishes the research problem and justification for conducting this research. This chapter also provides a brief description of the research methodology, an overview of the outcomes and an outline of the remaining chapters in this thesis. Figure 1.1 shows the structure of the chapter.



Figure 1.1: Outline of Chapter 1

1.2 Defining innovation in the public sector

The Organisation for Economic Co-operation and Development (2014, p. 8) defines the public sector as ‘the general government sector plus all public corporations including the central bank’. Mulgan & Albury (2003, p. 3) define successful innovation as ‘the creation and implementation of new processes, products, services and methods of delivery which result in significant improvements in outcomes efficiency, effectiveness or quality’. Hartley (2005) defines public sector innovation as generating new ideas that transform into outcomes with the aim of creating value. Bloch, Bugge & Slipersaeter (2010) suggest types of public sector innovations are product innovation, process innovation, organisational innovation and communication innovation. Similarly European Commission (2013) summarises the differences between private and public sector innovation as shown in Table 1.1 below.

Table 1.1: Differences between private and public sector innovation

Private sector	Public sector
• product innovation	• service innovation
• process innovation	• process innovation
• organisational innovation	• organisational innovation
• marketing innovation	• communication innovation

Source: European Commission (2013).

Research by Katsigiannis, MacDonald, Stewart-Weeks, Sturgess, Suggett, and White Katsigiannis et al. (2014) on Australian public sector innovation suggest that public sector innovation entails product, process, organisational and communications. Product innovation involves introduction of a good or service one that is new, or requires significant improvements in customer access, ease of use, or technical or functional in nature. Process innovation is the implementation of a new or significantly improved method for the creation and provision of goods and services. Organisational

innovation is the implementation of significant changes in the way work is organised or managed and finally communication innovation is the implementation of a new method of promoting the organisation or its goods and services (Carter 2010). However, innovation types both in private sector and public sector have evolved over the years and the evolution of innovation is discussed in Chapter 2 of this thesis.

1.3 The importance of public sector innovation

Research by Pärnaa & Tunzelmannb (2007) notes that the innovation capacity of public service organisations is under-researched. However, a recent study by Fabric, Zekic & Samarzija (2016) observed that managers in the public sector are beginning to appreciate the importance of management innovation to gain efficiencies by implementing new management concepts. According to Bloch, Jorgensen, Norn and Vad (2009), public services or underpinning public service processes are not entirely novel, instead public service innovation is underpinned by substantial improvements for efficiency gains, henceforth public sector innovation can lead to higher quality, efficiency and cost effective public services to businesses and citizens.

Harris & Albury (2009) identified that United Kingdom public sector innovation is an important part of the solution to economic and social problems such as an aging population, environmental issues and increasing costs of healthcare. Australia is also facing similar issues, as the population aged 65 years and older is projected to increase to 4.2 million or 18% of the population in 2021, but working age population income will only increase from 13.2 million to 15.1 million (Department of Health and Aging, 2016).

According to the Department of Infrastructure and Regional Development (2004), the aging population will lead to high level dependence on government for health and

aged care services. Australia is also facing many public service challenges due to the growing population. Australia's population is forecast to grow to 30.5 million in 2031, with the four biggest cities growing by around 45% (Wargent & Yardney 2015). The public sector has to face these challenges, and must use opportunities to innovate, however a number of barriers that prevent innovation in public sector organisations.

Whilst innovation is extremely important for public sector, Micheli, Schoeman, Baxter and Goffin (2012) suggest that there are three major barriers to public sector innovation including resistance to change, risk aversion and organisational structures. A survey by the Australian Public Service Commission (2010) provides a broad view of public service employee perceptions of barriers to innovation, as shown in Figure 1.2 below.

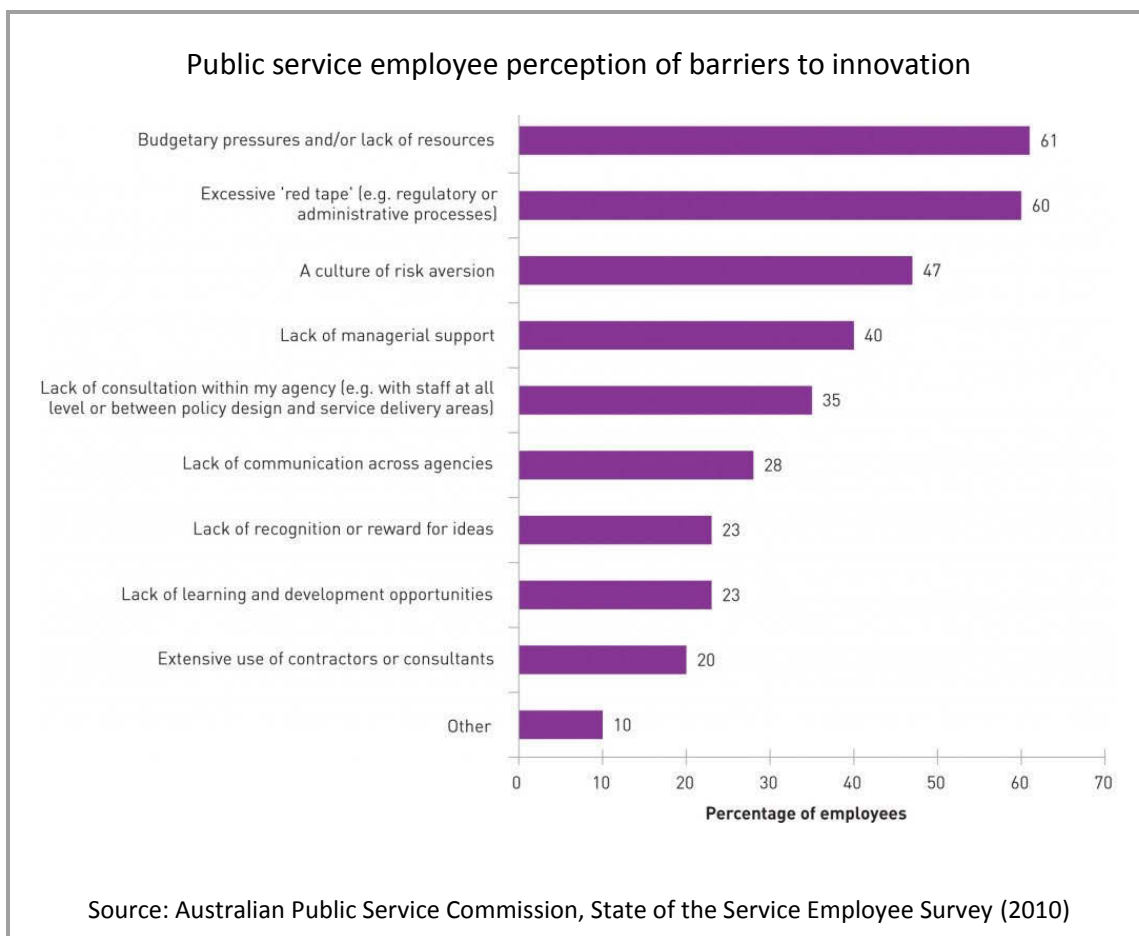


Figure 1.2: Public service employee perception of barriers to innovation

In contrast, Townsend (2013) from Canadian public sector perspective, claims that lack of innovation in the public sector is a traditional view, and the public sector is a fertile ground for innovation. Similarly Banks (2013) argues that enormous opportunities exist to transform Australian and New Zealand public sector, such as using advances in data management, using communications technology and adapting customer relationship models. Although there is enormous opportunity for innovation in the public sector, Agolla & Van Lill (2017) researched three public sector organisations in Kenya, Africa and claim that the public sector needs to overcome the barriers and put in right mechanisms and create environments to foster innovation. They also claim that internal and external drivers enable innovation in public organisations. Internal drivers are linked to strategy, organisational climate, strategic leadership, entrepreneurship, transformational leadership, resources, technology, customers, supplier relationships

and good management practices, whereas external drivers include political, economic, social, technological and legal factors (Agolla & Van Lill (2017).

Public service organisations in healthcare, education, justice and transport share similar characteristics in providing public services. Transport organisations have an obligation to move millions of people every day safely while other organisations have an obligation to ensure services and systems are safe and do not harm the public. Public sector organisations have significant media scrutiny, therefore risk, safety and reputation and rational solutions have a high priority over innovation. At the same time majority of public sector organisations are large, require complex management systems and have bureaucracy.

Spacey (2011) suggests that any large organisations face challenges to innovate for ten reasons; communication complexity, top heavy, office politics, duplications, decision making feedback, resistance to change, legacy systems, market share, too many products or services to focus on, and lack of passion for business. Similarly Aulet, Santos, Poulsen and Wagner (2010) claim five major obstacles in large organisations: companies are reluctant to risk existing revenue streams, structural obstacles to invention due to traditional innovation models, desire for predictable and consistent results, lack of training, and personal risk and reward profile where failure may impact individual careers. Hurman & Paykel (2016) summarise challenges to innovation from the perspective of large organisations in New Zealand, where the process challenges are culture and governance. From the process perspective, challenges are creating a sense of urgency, ambitious deadlines, getting closer to customers, creating smaller cross functional teams, innovation in parallel not serial, and delivering innovation prototypes more quickly. Cultural challenges are protecting innovations from organisational people who are negative and minimising 'no' to innovation, and de-

prioritising consensus. Governance challenges are assessing responsibility clearly and creating objectives and benchmarking.

Although large organisations have access to capital and the ability to source world class talent, innovation is still a challenge, because innovation is not about capital but about culture: it is about business philosophy, a way of thinking and conducting business and challenging the status quo. Management innovation is about changing the business philosophy and a new way of thinking that can change the way organisations operate. This research is focused on management innovation from large rail organisations perspective.

1.4 Innovation in rail organisations

Rail organisations face similar challenges to other public sector organisations including increasing demand for publicly-subsidised services. Increasing population is increasing travel and travel time in Australian capital cities. By 2031, without investment in transport in capital cities, the congestion could cost \$53 billion for Australia (Conifer 2015). Public transport services, including rail services, are part of managing traffic congestion in cities (Wargent & Yardney 2015). Traffic congestion not only costing money, it also accounts for 16% Australia's greenhouse gas emission in 2012 in which light vehicles shared 10% of Australia's total emission (CCA Climate Change Authority 2013), because seven in ten Australian use car to go to work and only one in ten Australian use some form of public transport (McCrindle 2014). Australian rail organisations require innovation to find new ways to solve growth issues and provide better services to public transport users, reduce environmental impacts.

Rail organisations have unique characteristics that can hinder innovation. They are large organisations, have complex management structures, have physical assets

located across large areas, and have high capital and maintenance costs. Above all, rail organisations are responsible for the safety of millions of passengers every day, particularly in urban areas. Sydney, the busiest rail network in Australia, carried approximately 292 million passengers in 2014–15, while Melbourne carried almost 227.5 million passengers, nationwide, rail urban patronage was approximately 644 million in 2014–15 (Department of Infrastructure and Regional Development - DIRD 2016)

Rail organisations not only provide passenger services, but also carry a significant quantity of goods, contributing to the economy of Australia. In Australia, 80% of iron ore and coal and 8% of grains, sugar, fertilisers and other bulk products are transported by rail freight services (Department of Infrastructure and Regional Development, (2014). Australian railways carried almost 1.3 billion tonnes of freight in 2014 (Dornan & Avery 2015). Innovation in rail freight services can enable cost effective goods transport and improve road safety.

Being responsible for the safety of millions of passengers, rail organisations are highly regulated and governed by standards and risk management practices which can be a barrier to innovation. British Railways identified five barriers to innovation: the franchising system works against innovation, the culture in rail is resistant to innovation, the procurement framework is unfit for entrepreneurs, the data framework is kept in silos, and the unreliable funding landscape is not output driven (Barrow 2016). Compounding factors such as strict rules, standards, bureaucracy and political agendas imposed by the government act as barriers to innovation and lead to a risk averse culture.

However rail organisations are finding new ways to innovate. For example, Italian rail organisation Nuovo Trasporto Viaggiatori (NTV) created an innovative business model

in 2012 in the high-speed rail market with massive investment to create a supply shock with an ambitious goal to achieve 20 to 25% of the high speed rail market (Desmaris 2016). In 2015, British Rail conducted a 48-hour innovation mission called HackTrains in which more than 120 software developers, designers, entrepreneurs and rail professionals boarded three trains at London to Paris to find innovative ways to improve customer experience (Barrow 2016). These examples indicate the rail organisation approach to innovation is a new management philosophy of inventing new business models to disrupt traditional practices.

Australian rail organisations require innovation to find new ways to solve growing travel issues and to provide better services to public transport users and goods transporters. Transport and rail organisation executives are starting to promote innovation in all aspects of rail services. They also are starting to develop an inherent knowledge of management innovation by inventing new business models and new principles that could enable a change in operating models, using new technology and mobilising staff differently to optimise performance.

Rail organisations are good at risk mitigation, whereas innovation requires risk-taking behaviours. Rail organisations are also good at making strict rules and following them, whereas innovation requires organisations to break the rules, and think outside the box. Therefore, establishing an innovation capability in a large public sector organisation such as a rail organisation requires effective and responsive management models, commitment and the capability to develop and implement innovation practices. To establish management innovation, large rail organisations need to understand the capabilities to initiate and implement management innovation and also understand how these capabilities align into a framework to implement management innovation. Therefore the topic of this research is how to build

management innovation in large rail organisations, which will provide a perspective on management innovation for large public sector organisations.

1.5 Management innovation capabilities

There is an increasing interest in management innovation, as this topic has only recently emerged in the field of innovation. In the last five decades, scholars around the world have examined and contributed to a significant body of theoretical and practical knowledge on the general topic of innovation (Christensen 1997; Daft 1978; Govindarajan & Trimble 2010; Sanderson & Uzumeri 1997; Skarzynski & Gibson 2008; Utterback & Abernathy 1975). While literature covers the types and processes of innovation, such as technological, scientific and organisational innovation, limited knowledge is available specifically on management innovation which is defined by Birkinshaw, Hamel & Mol (2008, p. 829) as:

'Invention and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organisational goals'.

Birkinshaw et al. (2008) have identified management innovation as fundamentally important to organisations and suggest that it occurs in four steps: motivation, invention, implementation and labelling.

It is important to understand the process of management innovation. Although the suggested process by Birkinshaw et al. (2008) is from a conceptual theory, it may not work effectively unless the process is supported by appropriate capabilities, particularly in large rail organisations. Parlier (2008a) claims that building management innovation capability should enable management to develop innovations to sustain organisational improvements. Management innovation capability is also regarded by

Parlier (2008b) as an important element in developing the internal and external change agents to facilitate internal innovation processes. Senior executives and managers are thought to be the important internal change agents to install management innovation, particularly in the large organisations which were the focus of previous studies.

This research explores and understands the capabilities that enable a large public sector organisation to make big changes to its existing management model, principles and practices, and how these capabilities can be developed into a framework for large rail organisations to use as a guide to implement management innovation.

1.6 Research gap and research question

This section describes the research gap and introduces the research question and provides an initial introduction to the Management Innovation Capability Framework that is developed in this research.

1.6.1 Research Gap

The current public sector operating model needs radical innovation at both the policy and service level (Deborah Cox et al. 2015). The Australian public sector recognises the need for innovation as a driver for change including strategic thinking and strategy driving innovation, adopting a culture of openness, and supporting innovation and idea management systems (Roberts 2014).

Management innovation is a distinct research area which can contribute at the policy and strategic levels to innovate management models and philosophies. While innovation studies have examined theoretical and practical applications of different types of innovations in organisations, these studies lack reliable knowledge of how

management responds to innovative opportunities in terms of management models, business processes and practices. What are the capabilities required to appreciate, understand, support and lead innovation? This is a question worthy of further exploration. Limited knowledge is currently available in the literature to help explain how managers view management innovation in large rail organisations.

Previous research contributions to innovation capability include innovation and technological capabilities (Saada & Zawdie 2005), knowledge acquisition and innovation capability (Liao et al. 2010), continuous improvement to innovation capability (Boer & Gertsen 2003), and building dynamic capability and innovation (Eisenhardt & Martin 2000a). There is limited empirical and theoretical knowledge available on how management innovation happens in the public sector. Birkinshaw, Hamel, et al. (2008) have argued that greater attention in an organisation is required to install management innovation capabilities.

Major changes to business-as-usual are necessary as customers of rail service organisations demand better services for the same or lower costs, and the government demands optimised service delivery for reduced funding.

Public sector organisations face many challenges when considering provisioning of better services to its customers as discussed in the previous sections, as barriers to innovation act as obstacles to the opportunities present in the public sector. Rail organisations have an important responsibility to provide safe, clean and reliable train services to the public, as they contribute to the functioning of daily life by taking millions of people to and from work, education and other services and move billions of tonnes of goods across the country. The results of this research on rail organisation capability for management innovation can help other large public sector organisations to adopt and benefit from implementing management innovation. Reviews of existing

research on management innovation suggest there is a lack of empirical evidence on how management innovation happens in large rail organisations, and how management innovation concepts are used for identifying strategic needs, resolving major problems and making radical changes.

Challenges facing the public sector, transport and rail organisations include improving customer service, providing services to the increasing population, adopting emerging technology, providing cost effective services, competing with private organisations, dealing with budget cuts, having a risk averse culture, having a high level of regulation, and maintaining public safety. Implementing management innovation will enable organisations to meet these challenges and develop capabilities for continuous innovations in all areas of public services.

1.6.2 Research Question

With this backdrop, this research attempts to answer to the following research question:

How can management innovation capabilities be built in large rail organisations?

To address this overall research question, there are four subsidiary research questions:

- 1) How is management innovation driven in large rail organisations?
- 2) How is a management innovation idea developed as a new concept?
- 3) How is the outcome of management innovation implemented and diffused to other situations?
- 4) How should these capabilities be aligned into a framework to implement management innovation in large rail organisations?

Adopting innovation requires multiple capabilities that have been defined and discussed in leadership and organisational theories of entrepreneurship, dynamic

capability and knowledge management, as well as support systems capabilities such as Six Sigma, Total Quality Management and project management. Management innovation is another kind of innovation and therefore capabilities discussed in generic innovation theories can be explored and identified as the basis for a new capability model for management innovation. At the same time, capabilities discussed in these theories overlap, and there is no defined capability framework to build management innovation in large rail organisations. Figure 1.3 shows the Management Innovation Capability Framework developed by the researcher for an initial guide for this research. Driving capability can be considered as an input to management innovation, developing capability is the process of management innovation and diffusing capability is the output of management innovation.

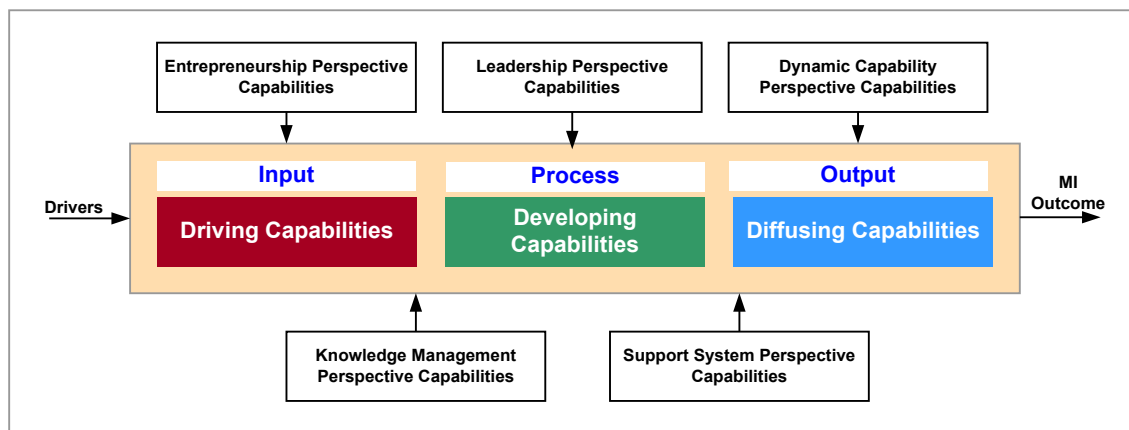


Figure 1.3: Management Innovation Capability Framework

1.7 Research justification

In responding to the research question, this thesis contributes to the growing pool of knowledge on management innovation. Most technological innovations are focused on production processes but the performance contributions of management innovation are still undetermined (Walker, Chen & Aravind 2015a). At the same time Fabic et al. (2016) highlighted that managers in the public sector are beginning to appreciate the

importance of management innovation to gain efficiencies and implement new management concepts.

Demand for rail services is increasing with growing populations and growing cities. The challenge for transport managers and rail organisations is to invest in new transport assets and also maintain existing assets and infrastructure. Rail organisations have a large base of installed assets which require integrated technology and technological solutions. Safety is paramount for rail organisations moving millions of passengers every day. A rail organisation's performance is measured by safety, reliability, cleanliness and customer satisfaction. Therefore, rail organisations focus on day-to-day operations with less focus on innovation. Rail organisations require management innovation to reinvent or make step changes to management practices, particularly in a complex, heavily regulated and busy environment.

The two terms capacity and capability are often used interchangeably in the research literature. For example, Teskey (2005) claims that capacity is the empowering properties that enable a system or individual to grow, survive, diversify and become tough. Similarly, Pearce & Conger (2003) observe that, in order to live and work efficiently and effectively with others, capable individuals have confidence in their ability, whereas Hamel & Heene (2003) and Teskey (2005) define capability strictly in terms of the capabilities and skills of individuals. While researchers oscillate between individual ability and their actions, Mumford et al. (2007b) clearly distinguish the capacity from the capability of leadership by defining capacity as what leaders possess and capability as what leaders do. Therefore, innovation capabilities (or what leaders do), when discussed in terms of entrepreneurship, leadership, knowledge management, dynamic capabilities and support systems, will assist in the construction of a theoretical framework for management innovation.

Hamel (2009) has also argued that a management capability model for management innovation that includes principles, processes and practices of management can create long-term advantages. This thesis focuses on the specific capabilities for building management innovation in large rail service organisations. This research is focused on what executives and senior managers do to initiate and implement a management innovation.

Baldwin, Allen, Winder and Ridgway (2005) suggest that the introduction of new practices related to management would emphasise a change or modification in an organisation. However, Hamel (2009) argues that management has stopped evolving, and insists that management principles, processes and practices need to be reinvented. While rail organisations are aware of the impacts of modernisation and globalisation, their challenge is to modernise legacy practices, introduce a customer-focused culture, cost effective and quality services. As such, the core argument underlying this thesis is how to build a management innovation capability framework to enable rail organisations to respond to modern business needs faster, and improve performance by changing management principles, models and practices. The management innovation capability framework can be adapted to other public sector organisations as many public sector organisations share similar characteristics in terms of the internal and external environments that impact the adoption of innovation.

This purpose of this thesis is to contribute to a growing pool of knowledge on management innovation, especially exploring an understanding of the enabling capabilities for management innovation. This is achieved by investigating how large rail service organisations can use management innovation by understanding the capabilities that drive and enable the development and diffusion of management innovation.

1.8 Research methodology

This research uses a mixed method approach, qualitative methodology to explore empirically the capabilities that can enable management innovation and quantitative methodology to analyse and validate these capabilities. For the qualitative method, three case studies of large rail organisations are selected including; eliminating level crossing incidents, establishing a Centre of Excellence in rail maintenance, and developing a customer service model. A survey research and confirmatory factor analysis using structural equation modelling enables to validate the capabilities. The targeted audience for both qualitative and quantitative research are executives, general managers and senior managers who understands how management innovation occurs in large rail organisations as a result of literature review and the empirical research a final validated management innovation capability framework is presented in this research.

1.9 Thesis structure

This thesis has seven chapters. This section provides an overview of each chapter.

- **Chapter 1** introduces the research topic, provides background to the topic and research problem, and outlines the central research question and four subsidiary questions.
- **Chapter 2** defines management innovation and reviews literature on the capabilities discussed in innovation and leadership theories including entrepreneurship capabilities, leadership capabilities, knowledge creation capabilities, dynamic capabilities and business systems capabilities to extract the specific capabilities that enable organisations to drive, develop and deploy management innovation.
- **Chapter 3** introduces the proposed Management Innovation Capability Framework based on the capabilities identified in the literature review. The framework aligns these capabilities in order to support management

innovation from initiation to implementation in large rail organisations.

- **Chapter 4** outlines the research methodology, providing a justification for the mixed methods research design employed and describing how empirical data is collected and how it is analysed using a mixture of qualitative and quantitative methods.
- **Chapter 5** presents the empirical research findings from the three case studies and survey research from three large rail organisations in Australia. These findings are used to refine the theoretical model, identify combined capabilities that enable management innovation in large rail organisations and present the summary of management innovation capabilities after validation using descriptive and confirmatory factor analysis.
- **Chapter 6** as the discussion and conclusion chapter, presents the Management Innovation Capability Framework and the key findings of the research, highlights the capabilities and their importance to implementing management innovation, discusses the managerial implications and summarises the limitations of this research and avenues for potential future research.

1.10 Chapter summary

This chapter has outlined the importance of innovation in public sector organisations, in large organisations and in rail organisations to set the context of the thesis. It has articulated the research focus area of management innovation and identified the need for a management innovation capability framework to be used in large rail organisations to innovate new management models and principles to improve performance. The draft Management Innovation Capability Framework with three stages of driving, developing and diffusing capabilities is introduced as an appropriate framework for this purpose. This chapter has also outlined the research question and provided an overview of each chapter. The next chapter presents a comprehensive review of the relevant literature.

2 Literature Review

2.1 Introduction

This chapter outlines the innovation landscape, defines management innovation and reviews existing literature to identify innovation capabilities from a theoretical perspective. Capabilities for innovation are discussed in many leadership and organisational theories including entrepreneurship, leadership, knowledge management, dynamic capability and business support systems such as Total Quality Management, Six Sigma and project management. This chapter reviews these theories to identify appropriate capabilities for management innovation. Figure 2.1 shows the structure of this chapter.

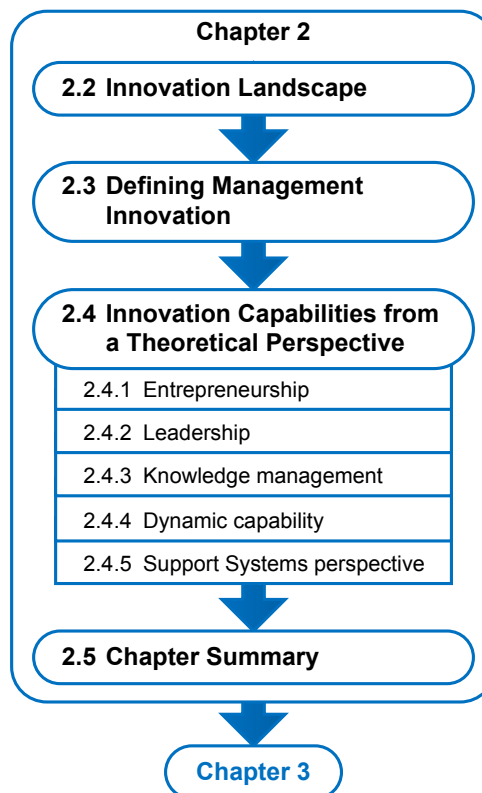


Figure 2.1: Outline of Chapter 2

2.2 Innovation landscape

Schumpeter (1942) refers to innovation as 'creative destruction'. The literature has focused on developing different types of innovations from product innovation, process innovation (Utterback & Abernathy 1975) and marketing innovation (Simmonds & Smith 1968), to service innovation (Barras 1986) then open innovation (Chesbrough 2004). Researchers have also explored the relationship of various types of innovation such as 'top-down vs bottom-up' (Daft 1978), 'incremental vs radical' (Dewar & Dutton 1986) and 'open vs closed' (Chesbrough 2004). Consequently, the range of innovation research has expanded in the areas of entrepreneurship (Parsons 1991), leadership (Bass 1995; Burns 1998), knowledge management (Nonaka & Konno 1998), dynamic capabilities (Daft 1978) and support systems related studies such as Six Sigma and innovation (Snee & Hoerl 2005), project management and innovation (Killen & Hunt 2009) and, most recently, in management innovation (Birkinshaw, Hamel, et al. 2008).

Figure 2.2 below illustrates the evolution journey of various types of innovation from creative destruction to management innovation with the focus areas for this research study highlighted in the boxes.

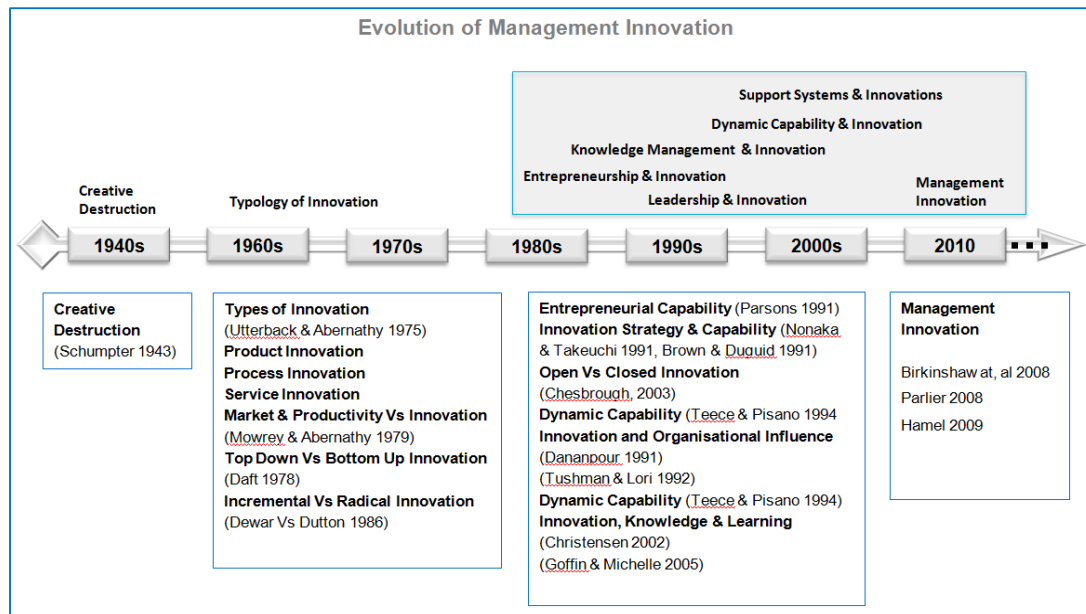


Figure 2.2: Evolution of management innovation

In the 1970s and 1980s, researchers became interested in understanding the process of innovation and its influence on productivity and the market and types of innovation. For example, Utterback and Abernathy (1975) conducted an empirical study on the relationship between product and process innovation while the market influence on product and process innovation was examined by Mowery and Rosenberg (1979). Innovation adaptation was examined by Daft, who identified distinct ‘top-down’ and ‘bottom-up’ innovations (Daft 1978). Another notable contribution was Damanpour’s work (1991), which used Daft’s (1978) Dual Core Model Framework to examine the relationship between the adoption of administrative and technical innovations and their impact on organisational performance. Damanpour's research indicated that changes to the social structure and administrative innovation lead to better technical innovation (Damanpour, Szabat & Evan 1989).

In the early 1990s, innovation research incorporated organisational theory with the aim of understanding innovation behaviour in organisations. For example, Damanpour (1991) researched organisational innovation and revealed 13 potential organisational

determinants for innovation. Nonaka and Takeuchi (1991b) demonstrated how organisations capture various forms of knowledge in an attempt to innovate and enhance organisational effectiveness. Tushman and Lori (1992) contributed to organisational innovation and the resultant technological change in organisations.

In the mid-1990s, innovation theory emerged with knowledge management theory, influenced by the resource-based and knowledge-based view of the firm (Grant 1996). Within this realm, researchers have shown considerable interest in researching tacit knowledge, learning, information and innovation in organisation (Howells 1996), and organisational learning and innovation (Brown & Duguid 1991).

In the 1990s innovation theorists also examined how dynamic capability influences a firm's competitive advantage (Teece & Pisano 1994). Lazonick and Prencipe (2005) studied dynamic capability and innovation and sustainability, and found that firms are in a better position when they deploy organisational capability for continuous innovation. Rothaermel and Hess (2007) suggest an intrinsic connection between dynamic capability and innovation, existing at the individual, firm and network levels.

Extensive research has been carried out in leadership and innovation in the 1990s and early 2000s including how charismatic leaders influence innovation (Nadler & Tushman 1990), and how transformational leaders encourage creativity and innovation (Bass 1995). In the early 2000s, researchers were interested in business model innovation (Week 2000) while researching entrepreneurship and innovation continued (Lawrence, Hardy & Phillips 2002).

While significant research has been conducted over the last five decades on different innovation topics, management innovation has only recently become a focus after recent research conducted by Birkinshaw et al. (2008) and Hamel (2009) which

provided extensive insights into how management innovation happens in large organisations. These research studies provided specific examples such as the Balanced Scorecard, Six Sigma and Total Quality Management. These inventions are not new, but understanding these initiatives as forms of management innovation is, and understanding that management innovation is another kind of innovation is also new.

It is evident the context, meaning and nature of innovation has evolved over time, encompassing product, process, technology and leadership innovation. Understanding the various kinds of innovation, the benefits, processes, risks and how to apply these to different situations assists firms to adopt a particular type of innovation to suit their needs. As management innovation is a relatively new concept, how it works in reality in various industries, and in different environments, is less researched and unexplored. Therefore, this research study provides insight into how management innovation works in large rail organisations. The next section defines management innovation.

2.3 Defining management innovation

Management innovation, as a field of innovation studies, received attention following research by Birkinshaw et al. (2008), who suggested a four-step process for management innovation: motivation, invention, implementation, and theorising and labelling; and defined management innovation as follows:

Management Innovation is the generation and implementation of a management practice, process, structure or technique that is new to the state of the art and is intended to further organisational goals. (Birkinshaw, Hamel, et al. 2008, p. 829)

While management innovation research has gained relevance in recent years, there is a lack of empirical research analysing the factors that favour it (Nieves & Segarra-Ciprés 2015). Innovation in management principles and processes along with

technological innovation has received growing academic interest (Camisón & Villar-López 2014).

Research has addressed management processes and practices in various organisational theories in the context of innovation. For example, Zbaracki (1998) suggests that a new set of processes and practices can reduce quality defects and improve customer satisfaction, while Laursen & Foss (2003) claim that human resource management practices influence innovation performance. Hargrave & Ven (2006) introduced a collective action model for institutional innovation where management innovation is referred to as a difference in the state, quality or form over time of organisational management activities, where the change is an unprecedented or novel change from the past.

Increasingly management researchers are interested in business model innovation, an innovation phenomenon introduced by Malhotra (2001), which involves changing the whole business model instead of just changing the business processes. Mitchell & Coles (2003) describe business model innovation as the complete replacement of the existing business model by a novel one. Business model innovation focuses on the business processes that deliver the outcome whereas management innovation focuses on the management processes and practices that can change the business model resulting in a new value proposition.

Hamel (2006) defines management innovation as a significant departure from conventional management practices, principles or processes. The argument of significant departure from conventional practices distinguishes management innovation from all other business-as-usual changes in management processes and practices. Adding to this, Hamel & Breen (2007b) define management innovation as a total change of institutional culture, primarily to improve performance of the

organisation in an integrated manner, which involves product innovation, technological innovation and process innovation.

In addition, Tyagi (2008) describes management innovation as also encompassing strategic innovation and collaborative innovation. Strategic innovation creates a portfolio of breakthrough growth of business opportunities by following a disciplined and innovative process. Collaborative innovation finds new synergies to harness the capability and creativity of other organisations (Drewery 2003). Hargadon (2005) suggests that companies aligning innovation strategy with the right people and appropriate work practices would innovate routinely. This view is also supported by (Nonaka & Kenney 1991b), who suggested that the leader's role in an innovating firm is as a catalyst and facilitator. However, having the strategy, people and a facilitator alone will not ensure implementation and sustain innovation in large organisations because large organisations have numerous disciplines, operational practices and needs that may require different innovative approaches.

Management innovation mostly occurs from the executive (top) management in large organisations at a strategic level. Policies, strategies and business plans are driven from the top, therefore inventions and implementing management innovation can significantly improve performance and enhance customer satisfaction. Hamel (2007) argues that there are three key elements enabling executives to drive management innovation: committing to a big problem, challenging management orthodoxies and exploiting the power of analogy. Hamel (2009) further added that management innovation can generate competitive advantage when the innovation is based on a novel management principle, systemic and ongoing rapid fire invention program.

Having management capabilities for management innovation can enable managers to facilitate and transform opportunities or problems into valuable products, services or

other outcomes. These include the creation, development and deployment of innovative ideas by co-relating technological trends, meeting customer market needs, resolving performance issues and making drastic improvements. Management innovation can benefit large rail organisations if relevant capabilities are understood and adopted in practice.

The next sections explore the capabilities from various theoretical perspectives to understand what capabilities enable the initiation and implementation of management innovation.

2.4 Innovation capabilities from a theoretical perspective

Given that management innovation is another kind of innovation, capabilities discussed in generic innovation theories can be explored and identified to develop a new capability model for management innovation. The model can take into account Mumford et al. (2007b), who distinguished capacity versus capability of leadership by defining capacity as what leaders possess, and capability as what leaders do. The following discussion reviews innovation capabilities in entrepreneurship, leadership, knowledge management, dynamic capabilities and support systems perspectives, with the aim of identifying capabilities to construct a theoretical framework for management innovation.

2.4.1 Management innovation capability from an entrepreneurship perspective

The term entrepreneurship refers to an individual translating a vision into a successful business enterprise (Kearney, Hisrich & Roche 2009). Leyden (2016a) claims that economic growth requires innovation, and that innovation can occur only through

entrepreneurial action. Alam & Hossan (2003) define entrepreneurship as a process by which people pursue opportunities, fulfilling needs and wants through innovation. Dewald (2016) defines entrepreneurial thinking as a process where a venture searching a non-standard approach can create value under uncertain conditions. On the other hand Lawrence et al. (2002) identify collaboration as an important capability of entrepreneurs to create new institutions. In addition, Hsua et al. (2014) describe entrepreneurship opportunistic activities as creating value and bearing risk. Estay, François Durrieu & Akhter (2013) claim that entrepreneurs exploit business opportunities and take risk. Nevertheless, entrepreneurship capability is widely understood as sensing opportunity, collaborating and taking risks to create value.

From the dynamic capability literature, Teece (2007b) points out that entrepreneurial behaviour of a manager is about sensing and understanding opportunities and initiating new ways of putting things together. Understanding opportunities can vary based on the situation. It could be a problem or an opportunity, and in some cases technology-driven. Feldman & Audretsch (1999) claim that sensing technology need is an important capability of entrepreneurship. In addition, Yu (2001a) describes entrepreneurial alertness as the activity of aiming for profits. Similarly, Wang et al. (2006) suggest that the purpose of entrepreneurship is to look for long-term benefits. Entrepreneurship is widely known for sensing opportunity for profit.

Entrepreneurship theories have historically been focused on individual entrepreneurship, but recent theories have focused on collaborative entrepreneurship (Ylinenpaa 2009b). Collaboration can also include a partnership or alliance as suggested by Drucker (1996) who argues that large organisations should foster entrepreneurship and learn to innovate to survive by partnership or alliance. A collaborative approach can bring a broader range of knowledge to the organisation,

assist with filling knowledge gaps, and eliminate group thinking or skills shortage (Agarwal & Selen 2009).

From a dynamic entrepreneurship perspective, Sarasvathya (2005), cited in (Cummings 2015), proposed five principles of entrepreneurship: acceptance of the situation, recognition of failure and setbacks, understanding the collaboration; awareness of new developments, and focus on the activities within their control. From these principles it can be inferred from a capability perspective that entrepreneurship acceptance of the situation may be interpreted as 'sensing opportunity', new development can relate to 'invention', and recognising failure can be referred to as 'risk-taking' capability.

The risk-taking capability is also supported by Alez-Benito, Munoz-Gallego & Zamora (2015). Entrepreneurship is also known for risk-taking (Miller 1983) and it is the primary capability of entrepreneurship (Carland et al. 1984). However public servants tend to be generally risk averse, therefore less likely to perceive entrepreneurial approaches to public problems (Clark 2016). It is a challenge for public sector entrepreneurs to overcome bureaucratic and political obstacles to innovate (Sanger & Levin 1992). Bureaucracy is a barrier to innovation due to old organisational models of compliance, command and control, and vertical communication, as fostering innovation requires counter-bureaucratic activities (Vigoda-Gadot et al. 2005), which may require risk taking in overcoming bureaucracy. At the same time, Kearney et al. (2009) suggests that entrepreneurship in the public sector produces superior organisational performance and support for organisational development and productivity. Quinn & Courtney (2016) argue that the public sector should be seen as a legitimate entrepreneur, and focus on innovation and make use of the resources, opportunity and infrastructure.

Entrepreneurship and innovation complement each other in an organisation to sense

and seize opportunities, collaborate and add value for profit. Entrepreneurship continues to develop and grow in the field of innovation particularly in private organisations. Thus it can be understood that entrepreneurship and innovation create new opportunities that can drive management innovation in public sector organisations such as large rail organisations.

Entrepreneurship and innovation overlap each other (Drucker 2002; Zhao 2005). Therefore, it can be inferred that management innovation requires combined capabilities for sensing opportunity and initiating innovation in order to take appropriate decisions to innovate. As innovation and entrepreneurship are complementary, the combination of entrepreneurship and innovation is essential to public sector and large rail organisations' sustainability and success in a changing and dynamic business environment.

Management innovation capabilities can be summarised, from the entrepreneurship perspective, as capabilities required by executives and leaders including **sensing opportunities, collaboration and risk taking**.

2.4.2 Management innovation capability from a leadership perspective

Leadership is important for mobilising resources to fulfil an organisational mission and it is essential for innovation and performance (Antonakis & House 2014). Leadership is one of the main influencing factors driving innovation in an organisation. As Deschamps (2005) suggests, innovation requires various leadership skills for various types of innovation such as bottom-up innovation, top-down innovation, product innovation, service innovation, business model innovation and management innovation. Kesting et al. (2015) found that different innovation stages make different

demands on leadership. However, the type of leadership style required to progress management innovation in large complex rail organisations from issue or opportunity identification to resolution or realisation is unclear. This section explores various leadership theories on innovation to identify capabilities suitable for a management innovation capability framework.

Hamel (2006) insists that leadership is essential since it influences innovation in management processes and principles which create long-term benefit and result in dramatic changes in competitive position. The literature reviewed advocates many leadership styles including charismatic leadership (Nadler & Tushman 1990), instrumental leadership (Bossink 2007), strategic leadership (Oke, Munshi & Walumbwa 2009; Rowe, Nejad & Nejad 2009), interactive leadership (Kazemek 1991), transactional leadership and transformational leadership (Burns 1998). However, capabilities discussed in these leadership theories overlap and it is unclear how these capabilities enable management innovation in large organisations.

Charismatic, interactive, instrumental and strategic leadership

Charismatic leaders are confident, effectively communicate, are persistent, willing to work very hard, and usually have a strong tendency to seek change (Javidan & Waldman 2003). A charismatic leader can lead and influence employees (Lee, Chen & Lee 2015a), influence by personal character as opposed to power, inspire followers and create change (Muenich & Williams 2013). From an innovation perspective, a charismatic leadership style communicates the need, motivates staff, provides process for innovation and contributes to new products (Barczak & Wilemon 1989; Nadler & Tushman 1990). Charismatic leadership in the public sector should focus on vision articulation, optimisation and enthusiasm (Javidan & Waldman 2003). Management

innovation, or any kind of innovation, requires motivation, influence, process, sharing information and creating change.

Similarly interactive and instrumental leadership styles also encourage participants and share information. For example, Kazemek (1991) states that interactive leadership encourages participants to share power and information. Interactive leaders are visionary, determined, involved and maintain integrity (Kazemek 1991). Rosener's (1990) study, cited in (Kesting et al. 2015), highlighted that interactive leaders encourage participants, share information and energise employees for different work tasks. In addition, Lee, Chen & Lee (2015b) claim that leadership that encourages participants through motivation and information sharing also enables sharing knowledge and ideas for innovation.

From an instrumental leadership perspective, Nadler & Tushman (1990) claim that an instrumental leadership style controls the innovation process by ensuring the goals, roles and responsibilities are communicated clearly. Rowold (2014)'s empirical study revealed four dimensions of instrumental leadership including environmental monitoring, strategy formulation, path-goal facilitation and outcome monitoring. Antonakis & House (2014) define instrumental leaders as experts in monitoring environment and performance and implementing strategic and tactical solutions.

From an institutional leadership perspective, Parson (1991) emphasised that building an innovative corporation requires three institutional capabilities: capability to generate new ideas, capability to develop new products and capability to add value to customers. Leca & Naccache (2006) emphasise that institutional entrepreneurship can create and change institutions without disembodying the social structure. Management innovation is capable of major institutional changes. Parson's view is very relevant in the context of management innovation because management

innovation can result in major institutional change, and the main reason for the change should be new services that add value to customers.

From a collaborative institutional entrepreneurship perspective, Ylinenpaa (2009a) suggests that institutional entrepreneurship plays a significant role in understanding strategic needs, customer value, and sensing opportunities to decide and initiate innovation within the institutional capabilities of an organisation. Researchers also suggest that the institutional leadership style is supportive in resolving strategic problems (Leca & Naccache 2006). Resolving a strategic problem could initiate a management innovation.

Strategic leadership capability also discusses similar capabilities like being visionary, future-oriented, proactive, risk-takers and influencing innovation (Oke et al. 2009; Rowe et al. 2009). Vicere (1995) claims that strategic leaders are visionary and find new ways to deal with the opportunities. Similarly, Sierra & Banzato (2016) suggest that while strategic leadership is focused on stability and efficiency, it is also receptive to change and innovation. Wilkins (2014) recommends that the public sector requires strategic leadership to cultivate innovation through filling gaps and sound judgement. With the executive position and power, strategic leadership can influence major change in organisations. The executives' view of the issues and opportunities is much greater than other layers of management, and therefore understanding strategic gaps and big issues may result in management innovation being initiated with a clear vision supported by adequate funding and resources. In this scenario, change is clearly driven by top management. In large organisations, 'top management' refers to the executives, or executive management, located above general managers in the management hierarchy.

Transformational and transactional leadership

Many researchers have further explored how the transformational leadership and transactional leadership styles influence innovation, and claim that transformational leadership influences innovation more than transactional leadership (Bass 1990; Lee & Chang 2006; O'Regan & Ghobadian 2006). Alternatively, Birkinshaw, Hamel, et al. (2008) state that, in terms of management innovation, the role of leaders is appropriate through both transformational and transactional leadership behaviours. The view that both transformational and transactional leadership behaviours contribute to management innovation is also supported by Vaccaro et al. (2012). In addition, Schweitzer (2013) found that transformational leadership helps to develop and transactional leadership helps to preserve change, which offers further evidence that both leadership styles are important for innovation.

While theorists argue whether transactional leadership or transformational leadership plays a more significant role in supporting innovation, the findings of Vaccaro et al. (2012) clarify this discussion in terms of the complexity of the organisation, indicating that less complex organisations benefit from transactional leadership while more complex organisations require transformational leadership to compensate for their complexity. Large rail organisations are more complex in their organisational structure and operational management systems. Therefore, transformational leadership should be more appropriate for management innovation in these organisations.

Transformational leadership motivates employees in attaining organisational goals (Bass et al. 2003). Rowold & Heinitz (2007) expand on this by suggesting attributes that support transformational leadership including inspirational motivation, idealised influence, intellectual stimulation and individualised consideration. Intellectual stimulation, from an innovation capability perspective, can be interpreted as 'creating new knowledge' while influence, motivation and individualised consideration relate to

collaboration capabilities.

Transformational leaders ensure that innovation and creativity are included in problem solving processes (Bass et al. 2003). Creativity, sharing ideas and motivations are all important for management innovation, as these capabilities enable the development of management innovation. The capabilities of motivation in creating new knowledge and working towards a common goal are addressed in various leadership theories. In addition, Fleishman, Mumford, Zaccaro, Levin, Korotkin, et al. (1991) claim that motivational behaviours encourage team members into exerting continual effort particularly during difficult situations. This could be applied to resolving big issues, which could drive the initiation of management innovation. Management innovation is not only driven by opportunities but it can also be initiated by big issues.

Researchers also indicate that transformational leadership behaviour is charismatic, inspirational, intellectually stimulating and individually considerate (Avolio, Bass & Jung 1999). These behaviours emphasise a consideration for individuals which encourages followers to share ideas (Schweitzer (2013). Inspirational motivation from leaders gives meaning to their followers, encouraging 'team spirit' and confidence to face problems. Idealised influence refers to the degree to which leaders are trusted, respected and admired, which can be linked with the influence to make the necessary change. Such leadership encompasses charismatic behaviour that assists followers to determine strategy with the leader and reinforces an intrinsic motivation for achieving goals.

Schweitzer (2013) reveals that transformational leadership support operational capabilities. In terms of management innovation, this could be interpreted to suggest that a transformational leadership capability supports the development and implementation stages of management innovation by motivating and influencing team

members to achieve the desired goals. Friedrich et al. (2009) have clarified these findings by noting that leadership for innovation must be facilitated at multiple levels of an organisation and across multiple stages of the creative process.

Large rail organisations have multiple layers of management, and hierarchy controls and the opportunity for innovation varies as this complexity can hinder creativity. The only way to achieve a better outcome for management innovation is through leadership that encourages staff to achieve organisational goals at all levels of the organisation, by working towards a common goal (Lee & Chang (2006).

From a top management perspective, research by Songkhla (2014) has found that CEOs with transformational leadership are associated with an innovation culture, strategy and product innovation. Similarly, research by Kim & Yoon (2015) suggests that transformational leadership creates a suitable climate for creativity. It can be inferred from the literature that transformational leadership adds significant value by establishing strategy, culture and motivation, by creating new knowledge, and by resolving big issues. For large rail organisations these attributes can enable management innovation at various stages from initiation to implementation.

Although the different leadership styles reviewed support innovation through various capabilities, many of these capabilities are common across the different styles. Ross & Gray (1997b) adopted these common capabilities and suggested two new types of leadership for innovation: 'Change Facilitator' and 'Influencing Others', which are both vital for management innovation. In addition, Ross & Gray (1997a) explained that the change facilitator leadership role is focused on understanding the need, creating the vision, and supporting and facilitating discussions, funds and tasks, while the influencing others role is focused on influencing staff to achieve the desired goal through their technical competence and accessibility.

There are many types of leadership capabilities that strongly support management innovation in the literature reviewed. Many leadership styles support management innovation including **staff motivation, creating vision and strategy, creating new knowledge, sharing ideas, influencing individuals and teams, facilitation, resolving tough issues**, and establishing **roles and responsibilities, communication, systems and processes for innovation**. These capabilities can support management innovation at various stages.

2.4.3 Management innovation capability from a knowledge management perspective

Petrash (1996) defined knowledge management as ensuring that the right information is available to the right people at the right time, so that the best decisions and correct actions can be taken at the appropriate time. According to Bellinger et al. (2004), knowledge management involves information, knowledge and wisdom. Jasimuddin (2005) states that knowledge management involves capturing, utilising, creating, transforming and storing organisational knowledge. Deng (2010), cited in (Xiaomi et al. 2014), describes knowledge management as identification, creation, distribution, utilisation and maintenance of organisational knowledge to fulfil its objectives.

Jasimuddin (2006) notes that, in the 1980s, knowledge management had many labels including knowledge acquisition, knowledge engineering, knowledge-based systems and computer-based ontology which eventually led to contemporary notions of knowledge management. Although the scope of knowledge management incorporates information sharing and management of knowledge as a system and its uses as required, from a management innovation perspective it is unclear that knowledge

management capabilities is needed to share knowledge and ideas to develop a management innovation.

Holtshouse (1999) proposed ten domains of knowledge management including 'sharing knowledge', 'responsibility for sharing knowledge', 'capturing and reusing past experiences', 'embedding knowledge into products, services and processes', 'producing knowledge', 'driving knowledge for innovation', 'mapping network of experts', 'building and mining customer knowledge bases', 'undertaking and measuring the value of knowledge' and 'leveraging intellectual assets'. Overall, the concept of knowledge management is about sharing information and ideas from an innovation perspective, and converting these into new or improved products, services and/or processes that add value to the objectives of the organisation.

Knowledge management and innovation

Knowledge management contributes to innovation by adding newness into products, services and a management model for management innovation. From an innovation and knowledge management capability perspective, Yazhou & Jian (2011)'s study found that organisational innovation partially mediates the relationship between knowledge management and organisational performance. On the other hand Inkinen et al. (2015) claim that while knowledge management practices are not directly associated with innovation performance, firms are capable of supporting innovation performance through strategic management of knowledge and competence. However Saunila (2014) clarifies three aspects of innovation capability have some effect on organisational performance including ideation (generating ideas), leadership culture and know-how development.

Glynn (1996) and Amabile et al. (1996) observed that innovation emphasises changing an idea into something usable and profitable, and encouraging ideas that have to be substantial for channelling the creative ability of the staff to convert ideas into innovations. For this, managers must facilitate innovation by generating and maintaining an environment that enables creativity and idea generation. These enabling conditions require the provision of opportunities and resources, and the removal of constraints or factors that could affect an individual's creativity (Amabile et al. 1996). Leadership plays a significant role in creating a positive environment to share knowledge and minimise constraints as Deshpandé, Farley & Webster Jr (1993) claim that knowledge management and innovation depict the significance of culture as a main determinant in the outcomes of innovation. While leadership and culture are important to support knowledge management, Girniene (2013) clarifies that in the process of creating ideas, methods of learning are fundamental for creation of innovation. Sharing knowledge, learning and exploring ideas for potential solutions are important capabilities for management innovation.

Tranfield. et al. (2006) proposed a model that recognises three unique stages in the innovation and knowledge management relationship: discovery stage, realisation stage and nourishment stage. The discovery stage includes the search for, and generation of, ideal external and internal environments for developing the potential of innovation that lies inside the organisation. In the realisation stage, the emphasis is on how the organisation is associated with the available set of elements that could satisfy the implementation and development of activities related to innovation through various steps. The nourishment stage permits either the development of new management methods or processes, or the development of new services and products in the organisation. The three stages can be applied to management innovation.

Explicit and tacit knowledge and innovation

Nonaka & Konno (1998) broadly classify organisational knowledge into two types: explicit and tacit. Explicit knowledge can be expressed in words and numbers, and shared in the form of data, scientific formulae, specifications and manuals, whereas tacit knowledge is personal, hard to formalise and difficult to communicate with others. Both types of knowledge are important. The knowledge-based view (DeCarolis & Deeds 1999) and the theory of dynamic capabilities (Teece, Pisano & Shuen 1997b) highlight how tacit and explicit knowledge complement and dynamically interact in creative activities (Nonaka 1994).

Tacit knowledge within management innovation exists at various stages and dimensions. These dimensions are explained by Nonaka & Konno (1998) through their Socialisation, Externalization, Combination Internalization (SECI) model – using a spiral process – and include sharing, articulating, translating and disseminating knowledge. However, Maula (2000) argued that two types of knowledge are insufficient, and divided explicit knowledge into two categories: highly structured and less structured knowledge. From a management innovation perspective, sharing knowledge is expected to require a novel approach, therefore less structured or unstructured knowledge (tacit) knowledge may be appropriate.

According to Jasimuddin (2006), knowledge management is a mixture of several different disciplines, including information systems, organisational theory, strategic management and human resource management. Alternatively, Hargadon & Fanelli (2002) suggest that organisational knowledge is the product of an ongoing and interaction between empirical and latent knowledge. A majority of the researchers in knowledge management agree that tacit knowledge is the most important knowledge type for learning, creativity and innovation. For example, Nonaka et al. (1991b), Howells (1996), Cavusgil et al. (2003) and Hirai and Uchida (2007b) all emphasise the

importance of tacit knowledge as the key to knowledge innovation. Tacit knowledge is often shared by organisational members in a social environment. Howells (1996) defines tacit knowledge as non-codified, disembodied 'know-how' that occurs via the informal take-up of learned behaviour and procedures.

According to Holtshouse (1999), knowledge flows between and among people within an organisation under social, cultural and environmental conditions. Bachmaier (2015) provided six ways to extract tacit knowledge including content creation, informal communication, networking, practice demonstration, storytelling and conceptual model. Tacit knowledge normally floats around social networks within and between organisations, where people share information and knowledge, and bounce ideas. Nonaka & Konno (1998) define two dimensions of tacit knowledge, including a technical dimension that encompasses personal skills and craft, and a cognitive dimension that consists of beliefs, ideals, values, schemata and mental models. The cognitive dimension of tacit knowledge shapes the way we perceive the world.

Alternatively, Hussi (2004) argues that the essence of knowledge creation is the interaction between tacit and explicit knowledge. Rather than acting separately, it is the dynamic interaction between these types of knowledge that generates innovation. Innovation requires the creation of new knowledge. Knowledge is created both internally by the organisation members, and externally in relation to the environment (Nonaka & Takeuchi 1995). Therefore, to achieve a better outcome and obtain the support necessary to implement new knowledge, management requires both internal and stakeholder involvement in knowledge creation, or new idea invention.

Van de Ven & Johnson (2006) examined three related ways in which the knowledge gap between theory and practice exists. Firstly, the gap between theory and practice is typically framed as a knowledge transfer problem. Secondly, theory and practice are

viewed as distinct kinds of knowledge, but they complement each other. The third view is that the gap between theory and practice is a knowledge production problem. Innovation is creating something new, therefore new knowledge creation is the most important capability of an organisation to enhance creativity and innovation of new products, processes and service through new knowledge, however understanding the problem can be an enabler or trigger point to look for new knowledge. Therefore, theory and practice can complement each other. It can be the same for management innovation by looking at management problems and creating new knowledge for a new management model.

Learning capability is another essential element for creating new knowledge. Learning can happen in an organisation through internal sources via formal and informal means, or it can happen externally through industry networks, customer channels, supplier knowledge, technology or new research. According to Howells (1996), the critical elements of tacit knowledge are 'learning by doing', 'learning by using' and 'learning to learn'. Learning can be intrinsically or extrinsically motivated. Learning depends mainly on individual ability, interest and the organisational culture and environment. Organisational learning and knowledge-sharing capabilities improve creativity and idea-sharing ability, which can result in innovative products or services. Therefore, through the learning environment, sharing tacit knowledge can enable the creation of new management innovation.

Large rail organisations use formal and informal capabilities to learn or develop new knowledge to improve performance or resolve organisational, process and product problems. Platforms for knowledge sharing in large organisations include formal knowledge management systems, learning and development, communities of practice, research, technical forums, lessons learned processes, analysis and reflections on

historical events, failures, internal processes performance trends and results, formal and informal social networks, researching market and technology trends, observing customers' new products, benchmarking with other organisations, and customer and stakeholder communications. All these platforms can support innovation in terms of understanding opportunities, gaps and problems to initiate management innovation and share ideas for innovative solutions.

Literature reviewed in this section shows there are a range of knowledge management capabilities that enable management innovation, particularly in the idea development stage. It is evident from the literature that **sharing tacit knowledge, generating ideas, and articulating ideas** are important capabilities for developing new ideas for management innovation. These capabilities enable the development of a new management innovation model, new business model, management processes and principles which may result in new products, services and processes.

2.4.4 Management innovation capability from a dynamic capability perspective

Dynamic capability describes three capabilities for innovation including resource configuration from a resource-based view (Eisenhardt & Martin 2000a), sensing opportunities (Teece 2007b) and collaboration capability (Agarwal & Selen 2009). All these capabilities may enable the initiation and development of management innovation. Resource configuration, sensing opportunities and collaboration are discussed below.

Resource configuration

Much of the literature agrees that dynamic capability relates to reconfiguring resources to meet organisational needs. Daft (1978) defines dynamic capability as aligning internal and external resources to add value to the organisation. Similarly, Teece, Pisano & Shuen (1997a, p. 517) define dynamic capability as a 'firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments'. Eisenhardt & Martin (2000a) offer an alternative interpretation of dynamic capability as the 'strategic rotations' by which managers alter their resources, integrate them together and recombine them to generate new value-creating strategies.

From a resource perspective, Gieskes & Langenberg (2001) suggest that dynamic capability deliberately draws on tangible and intangible resources. Liao et al. (2009) researched 120 internet-based companies, using a resource-based view of dynamic capabilities, and found that firms mobilise resources and capabilities and align them dynamically for changing opportunities and constant innovation. Various researchers suggest dynamic capabilities are a critical capability of firms to develop and deploy innovative ideas. These arguments all make it clear that dynamic capability is focused mainly on resource configuration and, for the purposes of management innovation, it is important to reconfigure resources to meet organisational needs. In large rail organisations, resource configuration could be aligned for either short-term or long-term needs. Short-term need refers to drawing resources such as forming a working group to address a specific problem, whereas a long-term need requires reconfiguring resources, which could be part of a restructure that occurs as a result of implementing a management innovation solution where there is a need to mobilise resources differently, resulting in an organisational restructure or reform.

There is a wider view about dynamic capability as resource configuration. However,

sensing the need is also discussed in dynamic capability theory, including sensing technology changes and stakeholder collaboration. These perspectives are discussed next to understand the capabilities for management innovation. It is not intended to analyse which view is appropriate for management innovation.

Sensing the need

In addition to resource configuration, dynamic capability is also known for sensing organisational needs. This role is emphasised by Teece (2007b) who proposed a 'sensing, seizing and reconfiguration' model of dynamic capability. Dynamic capability is a vital asset of firms in transforming innovative ideas into opportunities for improvement at all levels of the organisation. Wang & Ahmed (2007) describe dynamic capabilities as adaptive, absorptive and innovative capability. On the other hand Eisenhardt & Martin (2000b)'s theory of dynamic capabilities claims that dynamic capability exists in specific processes such as product development and strategic decision-making. Cyfert & Krzakiewicz (2016) suggest that sensing opportunities involves analysis of various trends, identification of the need for change and creation of new ideas. Managers in large organisations play a significant role in sensing the opportunity for innovation, configuring resources to the need, and adding value to the organisation.

Sensing technology changes, or the need to introduce technology, is also discussed within dynamic capability theory. Wang, Lu & Chen (2008) acknowledge that companies prefer to maintain their competitiveness through implementing an innovating technology capability. Similarly, Rothaermel & Hess (2007) claim that dynamic capabilities provide not only organisational ability to understand a potential change of technology, but also its ability to accept modification through innovation.

Technology plays a significant role in any kind of innovation, even in management innovation. Performance gaps may lead the search for technology solutions to change rail services and management processes to make them more effective and efficient and provide value to customers. Large rail organisations realise the importance of using technology to improve rail services, operations, maintenance, reliability, safety and customer service by introducing new technology.

Market dynamism, along with technological change, is also discussed as a driving capability for innovation in dynamic capability theory. According to Eisenhardt & Martin (2000a), the pattern of dynamic capabilities depends on market dynamism, particularly in high-velocity markets where the dynamic capability happens as a simple routine, whereas Teece (2007b) argues that dynamic capability is dependent on exposure to international commerce, opportunity and threats which drive the innovation. However, market dynamism may not influence large rail organisations because the business is stable and run directly or overseen by government agencies. Market dynamism is more appropriate for consumer-driven, market-based organisations such as manufacturing and high velocity organisations who set the pace in the market for new products outperform competitors in cost, speed, innovation, service etc (Spear 2008).

Stakeholder collaboration

Agarwal et al. (2013) researched a large telecommunications firm in Australia and found that collaborative organisational learning, collaborative innovative capacity, entrepreneurial alertness and collaborative agility are the key capabilities to foster innovation in services. Although dynamic capability theory is applied to study organisational learning capabilities, strategic aligning capabilities and new venture

creation capabilities, Killen & Hunt (2009) insist that stakeholder collaboration is an important capability for innovation within dynamic capability. For example, Ayuso, Rodríguez & Ricart (2006a) insisted on two important capabilities for innovation: stakeholder dialogue and stakeholder knowledge. From the resourcing perspective of innovation, Weeks (2009) suggests that dynamic capability enables firms to develop resources from the internal and external environment. Firms require the skills of a partner, customer or supplier to bring the innovation to marketplace.

The role of managers in large organisations is to sense needs and reconfigure resources to the organisational needs. In large organisations, reorganising resources requires business justifications, consultations and change management. Various studies of dynamic capability looked at defining dynamic capability and identifying where and how it exists in organisations. However, public sector organisations are bureaucratic, multi-layered hierarchies, tend to operate in departmental 'silos' making it difficult to configure resources for innovation (Halvorsen et al. 2005).

What is most important in this research is to understand management innovation capabilities from the dynamic capability perspective. Although the reviewed literature interpreted capabilities from different perspectives, capabilities that can enable initiation and implementation of management innovation are: **sensing the need, understanding technological need, reconfiguration of resources, and stakeholder collaboration**. These capabilities play an integral role in management innovation from the dynamic capabilities perspective.

2.4.5 Management innovation capability perspective from a support systems perspective

Organisations use a number of support systems to improve processes and product delivery such as continuous improvement programs like Total Quality Management, Six Sigma and project management to deliver new products or to project manage major organisational changes. Much research has been conducted to study how these systems support innovation. The following sections discuss support systems capability perspectives for management innovation.

Innovation process versus continuous improvement programs

Skarzynski and Gibson (2008), cited in (Ukko et al. 2016), suggest that to make innovation into organisational capability requires practical tools, processes and a mechanism. Implementing effective and consistent innovation requires a formal program and process. Parsons (1991) recommends a five-step approach to implement innovation: 'diagnosing the need', 'integrating innovation into overall strategy', 'building special skills', 'creating a cross-functional approach', and 'managing the innovation process'. While Parsons perceives innovation as a program, Phillips and Hering (2005) regard it as a process and their recommended five-step process includes 'generating new ideas', 'capturing ideas', 'evaluating ideas', 'products and services', and 'launching'. Similarly Birkinshaw et al. (2008) propose a four-step management innovation process: 'motivation', 'invention', 'implementation', and 'theorising and labelling'.

The process for implementing innovation may seem to be straightforward, and it is important to have processes for consistent implementation and management of any kind of innovation, including management innovation. At the same time, implementing management innovation in large rail organisations is very difficult as operational

priorities, constrained by strict rules, standards and safety and risk management, take precedence over innovation. Irrespective of constraints to initiate, implement and sustain management innovation, a process or methodology is one of the most important capabilities. Moreover, there are already business systems and continuous improvement programs in place, and the challenge is whether to integrate management innovation with these other management practices. As large rail organisations are already characterised by complex management systems and processes, does management innovation require another management system?

There are many support systems available in large rail organisations to initiate and make improvements. This research is focused on organisations that operate and maintain rail assets and provide rail services, rather than rail manufacturing organisations. Rail organisations have support systems for continuous improvements, such as Six Sigma, Total Quality Management and project management, to manage projects and initiatives. The following discussion explores the relationship between innovation and these support systems to understand capabilities to implement management innovation.

Continuous improvement programs such as Six Sigma and Total Quality Management (TQM) help to establish a positive climate for change. Panuwatwanich, Stewart & Mohamed (2008b) investigated the roles of specific climates for innovation and found that perceived organisational culture is the gateway to diffusion of innovation. They found that the leadership role of creating a supportive culture helps to foster innovation, including high levels of freedom and autonomy, flexibility and risk tolerance. Similarly, Hoang, Barbara & Tritos (2006) examined TQM practices in Vietnam and found that if TQM is implemented in a firm it not only enhances performance but also allows and eases a culture of innovation.

Honarpour, Jusoh & Md Nor (2012) investigated the relationship between knowledge management, TQM and innovation and found knowledge management is seen as an enabler which could be used to implement innovation by generating, storing, transmitting and applying knowledge, whereas implementation of TQM is considered a significant factor that could have a positive influence on management innovation. Daniel & Amrik (2003) also observed that a positive relationship exists between innovation and TQM, and posited that firms adopting TQM in their corporate culture and business systems are fertile environments for innovation.

Alternatively, several studies claiming that TQM promotes practices and principles that hinder innovation have rejected any positive correlation between innovation and TQM (Glynn 1996; Slater & Narver 1998). Slater & Narver (1998) suggest that a customer-oriented philosophy would enable organisations to concentrate only on incremental enhancement to current goods and services activities rather than generating novel solutions. At the same time, Leavengood & Anderson (2011) have examined the correlation between innovation and TQM and claim that quality-oriented companies, predominantly in the manufacturing sector, are not innovative. Although rail organisations are certified for ISO 9001 based Quality Management System (QMS), innovation is not included as part of the QMS standards. As such, rail organisations implement Six Sigma programs for continuous improvement rather than TQM.

Researchers also have conflicting opinions on whether Six Sigma supports or hinders innovation. Snee & Hoerl (2005) claim that Six Sigma addresses three basic concepts: defects, processes and variations. Six Sigma methodology requires gauging a process, namely defects, by measuring process variations. Six Sigma assists with minimising variations or removing defects to make processes more efficient, with fewer rejections or less customer dissatisfaction, greater profitability and consistent generation and

delivery of services or products that fulfil and exceed customer expectations. The Six Sigma process level is estimated by the ratio of the number of defects to the number of chances or opportunities for defects. By focusing on the defects, Six Sigma restricts novel approaches and radical innovation, whereas management innovation happens in an organisation from novel ideas or radical innovation.

Hoerl & Gardner (2010) argue that Six Sigma is not the best method for identifying opportunities for disruptive innovation for organisations to succeed in the long term. They strongly suggest that organisations seeking long-term success will need to have a balanced approach to business improvement that includes systems for problem solving and continuous improvements, as well as systems to identify opportunities for disruptive innovation. Six Sigma is good for incremental innovation. Antony, Setijono & Dahlgaard (2016), after researching 10 UK companies, claim that Six Sigma is fostering process, product, service and incremental innovation.

Although many studies support the positive relationship between Six Sigma and innovation, McCreery (2008) highlighted that various sources suggest that Six Sigma and innovation are opposite to each other. However, he acknowledges that innovation is used in numerous contexts within Six Sigma, particularly in new product development or new service development, research and development and in portfolio management. This is supported by Eisenhardt & Martin (2000a) stating that innovation exists in special processes such as research and development, new product development and decision-making. According to Hoerl & Gardner (2010) Six Sigma clearly stimulates creativity, but it is not the best method for identifying ideas for breakthrough innovation. While Hoerl & Gardner (2010) argue that Six Sigma is a scientific method, Hamel (2008) suggests that innovation is based on novel management principles.

From the literature reviewed, it is clear that there is a relationship between innovation, Six Sigma and Total Quality Management. However, the relationship is mentioned only in the context of creating a positive climate for innovation and having a culture that can adopt improvements. The philosophy of Six Sigma and Total Quality Management is continuous improvement based on (scientific) facts and figures not based on novel principles, whereas management innovation requires a novel approach to resolve issues and realise opportunities.

Project management

The outcome of management innovation could result in a number of projects which require innovation project portfolio management, and also involve a broad variety of methods for evaluating, selecting and prioritising projects for long-term growth and strategic objectives (Killen, Hunt & Kleinschmidt 2008; Spieth & Lerch 2014). According to Iakovleva (2014), innovation is implemented mostly through projects. However, project management is focused on planning and delivery functions through a scientific management approach, whereas innovation requires novel ideas. Therefore innovation methodology allows organisations to come up with a concept, and once the concept is shown to be feasible, project management can take care of the project scoping, detailed design, project planning, delivery and governance of the expected outcome of management innovation.

In addition to project management, Bowers & Khorakian (2014) recommend incorporating project risk concepts at the management innovation stage gates. As organisations that deliver high-value projects, large rail organisations generally have in place excellent project management methodology, risk management, and stage gates for approvals and governance. To make innovation work, it makes sense to use these

existing business processes. Kettinger and Grover (1995a) also support this view, stating that major improvements can be achieved with business objectives by applying innovation to business processes.

This view is further reinforced in the concept of 'Total Innovation Management' proposed by Menke et al. (2007) which posits that innovation can be integrated into all elements of an organisation's business systems, such as through strategy, marketing and business processes, and be institutionalised to be culturally accepted by everyone in the organisation. Rail organisations already have multiple systems and governance in place to manage business processes, allocate funds and monitor performance. Management innovation is likely to work better if existing systems are followed for implementation of management innovation.

Management innovation happens at the strategic level. Management capability for management innovation should focus on business strategy, key initiatives and major projects to identify opportunities to make radical improvements or integrate creative elements to the existing initiatives. This is possible only if management innovation occurs or is supported at top management level, using existing business processes to deliver the outcome.

It is clear that a strong relationship exists between innovation and project management (Järkvik, Berggren & Söderlund 2007). In large organisations, **project management methodology** provides appropriate tools, methodology, risk management, stage gates review and approval and thus provides a platform for **management of a portfolio of innovation projects**.

2.4.6 Management innovation outcome

Management innovation is usually initiated by a problem or opportunity. The outcome of management innovation should provide a solution. According to Damanpour et al. (2014), a management innovation outcome positively affects firm performance. Similarly Hollen, Van Den Bosch & Volberda (2013) emphasise the importance of the benefits of combining technological innovation with management innovation. Similarly Walker, Chen & Aravind (2015b) claim that management innovation influences technological innovation. Implementing management innovation can bring tangible and non-tangible benefits as Peeters, Massini & Lewin (2014) claim that absorptive capacity routinely influence the efficiency of management innovation by sharing ideas within the organisation and external organisation by learning and collaboration. Learning and sharing knowledge can result in a new management model and the management model appears to be a non-tangible benefit, but it can create many tangible benefits as a result of adopting a new way of working or delivering services to customers.

The purpose of any type of innovation such as product, process, marketing, technology or organisational is essential to create value and use competitive advantage for survival and growth (Tuan et al. 2015). Management innovation can influence any other type of innovation based on the context of problem or opportunity. New management principles and models can drive changes to the operating models which will impact product, process, marketing, technology or organisational innovations in order to achieve the vision or objectives of management innovation, otherwise establishing management innovation may not add any value to the organisation.

According to the Australian Government Information Services for Business (2016) ‘innovation-active businesses’, are more productive and generate more jobs than non-

innovation-active businesses and the following are the benefits of innovation:

- having more efficient and effective work processes
- saving time and money
- driving sales and results as innovation can be a profit centre
- increasing business agility
- increasing customer satisfaction
- complying with legislation and possible tax benefits
- encouraging and supporting diversity
- leading to competitive advantage (AGISB 2016).

The benefits are based on the industry, situation and opportunities. Some of the benefits may be relevant to rail organisations and some are not as important. It is also important to establish metrics against the business objectives and measure the benefits. If not stated and captured in the business plan, it is difficult to capture the benefits in large rail organisations due to their complexity and operational priorities.

2.5 Chapter summary

The literature reviewed in this chapter provided the definition and purpose of management innovation, and explored management innovation capabilities drawn from five main areas: entrepreneurship, leadership, dynamic capabilities, knowledge management and support systems. Establishing management innovation requires the understanding of appropriate capabilities and they enable the initiation and implementation of management innovation.

Table 2.1 summarises the findings from literature addressing various perspectives of management innovation, from which enabling capabilities can be identified.

Table 2.1: Enabling capabilities for management innovation from a theoretical perspective

Theory	Theoretical references	Enabling capabilities
Entrepreneurship and Innovation	<p>Sensing and understanding opportunities, and initiating (Teece (2007b))</p> <p>Sensing technology need (Feldmana & Audretschb 1999)</p> <p>Entrepreneurial alertness as the activity of endeavouring profit (Yu (2001a), look for long-term benefits (Wang et al. (2006))</p> <p>Creating destruction in the market for economic development and growth (Ylinenpaa (2009c))</p> <p>Large organisations should foster entrepreneurship and learn to innovate through partnership or alliance (Drucker (1996))</p> <p>Entrepreneurship also known for risk taking, assess the risk of developing and executing innovative projects (Alez-Benito et al. (2015))</p>	<p>Sensing opportunity & initiating</p> <p>Sensing opportunity through technology need</p> <p>Sensing opportunity as a result of entrepreneurial alertness</p> <p>Sensing opportunities through benefits</p> <p>Sensing opportunities via business growth</p> <p>Fostering innovation through stakeholder alliance and partnership</p> <p>Taking risks</p>
Leadership and Innovation	<p><i>Charismatic, instrumental and interactive leadership</i></p> <p>Motivates staff, provides process for innovation and contributes to the new product (Nadler & Tushman 1990)</p> <p>Encourages participants, shares power and information (Kazemek (1991))</p> <p>Encourages participants in motivation and sharing information, knowledge and ideas (Wan-I Lee et al. 2015)</p> <p>Instrumental leadership style controls the innovation process by ensuring the goals, roles and responsibilities are clearly communicated, standards, systems and process (Nadler & Tushman (1990))</p>	<p>Motivating staff</p> <p>Having process for innovation</p> <p>Developing new product</p> <p>Encouraging staff</p> <p>Sharing information</p> <p>Sharing knowledge</p> <p>Sharing ideas</p> <p>Establishing goals, roles and responsibilities</p>
	<p><i>Institutional leadership</i></p> <p>Building an innovative corporation requires three institutional capabilities including capability to generate new ideas, capability to develop new products and capability to add value to the customers (Parsons 1991)</p> <p>Institutional entrepreneurship plays a significant role in understanding strategic needs, customer value, sensing opportunities (Johannission 2000, 2005, Ylinenpaa 2010)</p> <p>Institutional leadership reinforces and develops innovation and establishes organisational structure, systems and strategy (Zahara and George 2002, Fedor et al. 2003, Helfart et al. 2007)</p>	<p>Generating new ideas</p> <p>Developing new products</p> <p>Adding value to customer</p> <p>Understanding strategic needs</p> <p>Creating value for customers</p> <p>Sensing opportunities</p> <p>Establishing system and strategy</p>
	<p><i>Strategic leadership</i></p> <p>Visionary, future oriented, proactive and risk takers and influence innovation (Oke et al. 2009;</p>	<p>Creating vision</p> <p>Taking risks</p> <p>Influencing others</p>

Theory	Theoretical references	Enabling capabilities
	<p>Rowe et al. 2009) Strategic leadership focus on stability, efficiency and receptive of change and innovation (Sierrai and Banzato 2016)</p> <p><i>Transformational and transactional leadership</i> Motivates employees for attaining the organisational goals (Bass et al. 2003), encouraging team (Schweitzer (2013) CEOs with transformational leadership are associated with innovation culture, strategy and product innovation (Songkhla (2014) Transformation leadership creates the climate for creativity (Soonhee Kim¹ and Gyunsoo Yoon 2015) Transformation leadership has two types of leadership for innovation including Change Facilitator and Influencing Others (Ross & Gray (1997b)</p>	<p>Focusing on stability, efficiency Receptive of change and innovation</p> <p>Motivating others Encouraging teams Establishing innovation culture Establishing strategy Innovating new products Creating the climate for creativity Facilitating change Influencing others</p>
Knowledge Management and Innovation	<p>Sharing knowledge, driving knowledge for generation for innovation, sharing information and ideas, new or improved products, services and/or processes (Holtshouse 1999) Exploration fosters exposure to new innovative applications, ideas (Amabile et al. 1996) Tacit knowledge is the key to knowledge innovation (Hirai and Uchida (2007b) SECI model dimensions include sharing, articulating, translating, disseminating knowledge (Nonaka and Konno 1998)</p>	<p>Sharing information and ideas Exploring ideas Sharing tacit knowledge Articulating and translating Disseminating knowledge</p>
Dynamic Capability and Innovation	<p>Dynamic capability is aligning internal and external resources to add value (Daft (1978) Dynamic capability is a firm's ability to integrate, build, and reconfigure internal and external competencies (Teece et al. (1997a) Dynamic capability is the strategic rotations by which managers alter their resources, integrate them together and recombine them (Eisenhart & Martin 2000) Firms mobilise resources and capabilities and align them dynamically for changing opportunities and constant innovation (Liao et al. (2009) Dynamic capability as 'sensing, seizing and reconfiguration' (Teece 2007) Dynamic capabilities provide not only organisational ability to understand a potential change of technology (Rothaermel and Hess 2007) Collaborative organisational learning, collaborative innovative capacity (Agarwal et al.</p>	<p>Aligning resources Reconfiguring resources Reconfiguring resources to add value Aligning resources dynamically for changing opportunity Sensing and seizing and reconfiguring Sensing changes to technology Collaborating with stakeholders</p>

Theory	Theoretical references	Enabling capabilities
	2013) Two capabilities are important for innovation including stakeholder dialogue and stakeholder knowledge (Ayuso et al. 2006)	
Support System and Innovation	Five step approach to implement innovation including: diagnosing the need, integrating innovation into overall strategy, building special skills, creating a cross functional approach and managing the innovation process (Parsons (1991, p. 12) Management innovation process steps including motivation, invention, implementation, and theorising and labelling (Birkinshaw et al. (2008, p. 825) Perceived organisational culture is the gateway to the diffusion of innovation (Panuwatwanich et al. 2008) Continuous improvement programs such as TQM and Six Sigma creates positive climate for innovation (Panuwatwanich et al. 2008, Hoang et al. 2006) Project portfolio management of innovation projects (Killen, Hunt & Kleinschmit 2008, Spieth & Lerch 2014)	Establishing methodology Establishing process for innovation Creating organisational climate Having project management capability Having project portfolio management
Management Innovation Outcome	Combining technological innovation with management innovation (Hollen et al. (2013) Management innovation influences technological innovation (Walker et al. (2015b) Innovation is to create value and take competitive advantages for surviving and growing (Tuan et al. 2015) Capacity routines influence the efficiency of management innovation by sharing ideas and collaboration (Peeters et al. (2014)	Having technology innovation capability Creating value Creating competitive advantage Influencing efficiency Collaborating with stakeholders Improving productivity Generating more jobs

Many of the capabilities discussed from each topic overlap. However, these capabilities can be contextualised to a new framework for management innovation by aligning capabilities to various stages of management innovation. The next chapter proposes a Management Innovation Capability Model for large rail organisations to address gaps in management innovation theory which can then be tested with empirical research.

3 Research Model

3.1 Introduction

The proposed Management Innovation Capability Framework is a theoretical framework to implement management innovation in large rail organisations, based on findings from the literature review in Chapter 2. This chapter defines three distinct stages within the framework: the driving, development and diffusion stages. It then aligns enabling capabilities to these three stages to create the MANAGEMENT INNOVATION CAPABILITY FRAMEWORK. Figure 3.1 shows the structure of the chapter.

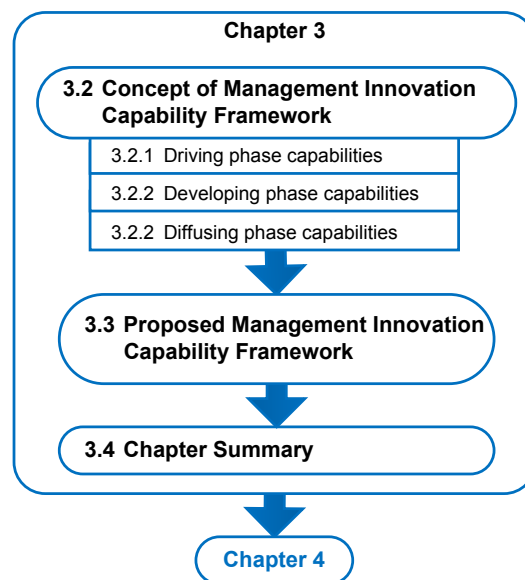


Figure 3.1: Outline of Chapter 3

3.2 Concept of management innovation capability framework

Figure 3.2 is a high-level illustration of the concept of the proposed framework.



Figure 3.2: High-level concept of Management Innovation Capability Framework

Large rail organisations require a strong driver to take up management innovation because the required funding and approvals for innovation come ultimately from government or government agencies. According to Hsieh (2011), often an organisation responds in the form of management innovation to improve efficiency or safety for a public service in response to the public demand. Governments and rail passengers demand efficient, safe and affordable rail services. Anything that threatens the safety of rail services becomes a high profile political issue that demands a significant response through changes to current management practices, structure or management processes to improve public services and prioritise public interest ahead of profits (Klein et al. 2012). Management innovation can also be referred to as improvements to the business objectives through innovative business processes (Kettinger & Grover 1995b). Management innovation can assist large organisations to achieve their business objectives by reinventing their management practices for better outcomes.

The management innovation process discussed by various researchers usually consists of three to five stages. To construct the theoretical model, a three-stage approach similar to Tranfield. et al. (2006) is used: discovering the need stage, or what is driving the organisation to take up management innovation; realisation stage or development of idea to a potential solution to management issue or opportunity; and nourishment stage or diffusion of management innovation to other situations.

From a product innovation perspective, Jeffrey & Dean (2005) proposed three stages including generating ideas, capturing and evaluating, and launching products and services. Generating ideas for new products is similar to discovering ideas but for management innovation initiated due to a major problem or opportunity (Hamel 2009). The development stage consists of capturing and evaluating ideas. The initial

idea is further developed for a maximum potential solution, and product launch is similar to implementation or diffusion of management innovation in the organisations.

Parsons' (Parsons 1991) innovation process starts with diagnosing the need which is similar to Tranfield. et al. (2006) discovering the need. On the other hand Birkinshaw, Hamel, et al. (2008) suggest motivation to initiate a management innovation. Motivation could be intrinsic that drives a manager to initiate a management innovation. However motivation requires a driving force and a good reason to justify, initiate and proceed with a management innovation to the development stage.

Developing an idea into a conceptual solution or prototype stage is the developing stage, similar to Jeffrey & Dean (2005)'s capturing and evaluating ideas, Nonaka & Konno (1998)'s idea sharing and translating and Tranfield. et al. (2006)'s realisation stage. In a management innovation process Birkinshaw, Hamel, et al. (2008) refer to the developing stage as the invention stage. In this stage ideas are generated, evaluated or filtered and shaped to a potential solution, whether it is a product innovation, process innovation, service innovation or management innovation.

Once the idea is developed the outcome needs to be diffused. The diffusing stage is described by researchers in various terms such as disseminating knowledge (Nonaka & Konno 1998), product service launching (Jeffrey & Dean 2005) and deployment of the outcome of management innovation (Birkinshaw, Hamel, et al. 2008).

The literature discussed above is summarised in Table 3.1. To better understand the capabilities that drive initiation, enable development, and support diffusion of management innovation, three stages of management innovation capabilities are used to guide this research. The table also shows various leadership and innovation theories discussed in Chapter 2 and possible alignment of these theories into the driving,

developing and diffusing stages to align the capabilities for these stages.

Table 3.1: Management innovation process steps aligned to three capability stages

High-level alignment of theories to the innovation stages			
Leadership Theories	Entrepreneurship Leadership Dynamic Capability	Leadership Dynamic Capability Knowledge Management	Leadership Support Systems
Innovation Process Stages (Hollen et al. 2013)	<i>Driving capability</i>	<i>Developing capability</i>	<i>Diffusing capability</i>
Tranfield et al. (2006) Model recognises three unique stages in innovation and knowledge management relationship	Discovery stage	Realisation stage	Nourishment stage
Nonaka and Konno (1998)		Knowledge sharing & articulating Translating	Disseminating knowledge
Parsons (1991, p. 12)	Diagnosing the need Integrating innovation into overall strategy	Building special skills Creating a cross functional approach	Managing the innovation process
Jeffery and Dean (2005, pp. 8-9)	Generating new product ideas	Capturing ideas Evaluating ideas	Products and services Launching
Birkinshaw et al. (2008, p. 825) Management Innovation Process	Motivation	Invention	Deployment Theorising and Labelling

As discussed in Chapter 2, the capabilities for enabling management innovation exist within leadership, entrepreneurship, dynamic capability, knowledge management and support systems, however the capabilities overlap throughout the management innovation process. The following section reveals the capabilities for the driving, development and diffusion stages adopted from Hollen et al. (2013) discussed in the following sections. The figure 3.3 shows the leadership theories aligned to the proposed management innovation capability framework.

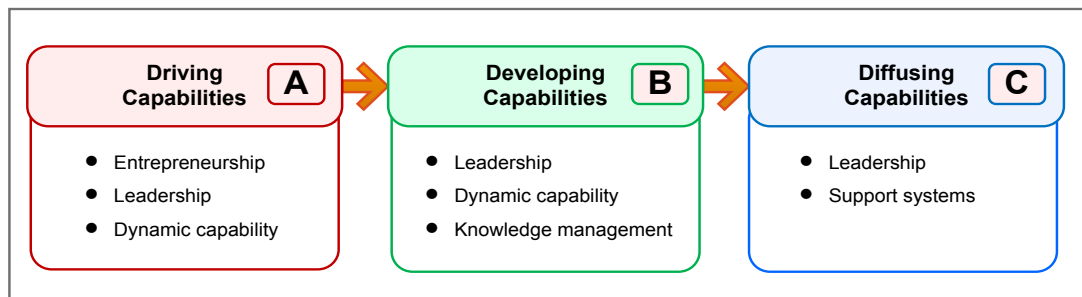


Figure 3.3: Management innovation capability framework stages and leadership theories

Management innovation requires executive management commitment and a desire to initiate, support and drive management innovation, support the development of a conceptual idea into a practical solution and implement a new management model, principle or practice and diffuse to other situations.

3.2.1 Driving capabilities for management innovation **A**

According to Deschamps (2005), driving management innovation requires a strong commitment, passion and resource capabilities to develop and deploy an innovative solution. Stimulating innovation is usually triggered by a decline in corporate growth or competitiveness. Higher performing organisations in today's market may not be the same in tomorrow's market. When low performance organisations fall below target, managers will search for new ways until performance reaches expectations (Derfus et al. 2007).

Sheremata (2004b) suggested radical innovation can be more profitable than incremental innovation. Similarly, the results of surveys and case studies on continuous innovation practices and operational performance at two multinational manufacturing companies by Laugen and Boer (2008) indicate that innovation had a positive influence on performance.

The performance of large rail organisations can be measured using indicators such as

customer satisfaction, safety, on time running, cleanliness and cost. Decline in any of the key performance areas may drive senior management to explore new ways of operating the business, and may result in a management innovation. Innovation can make incremental or radical improvements based on the magnitude of the issues or opportunities. Continuous innovation is required for bottom-up innovation in large rail organisations. Often this is incremental innovation, whereas management innovation is top-down, and driven by executives. Therefore sensing the need for management innovation, and driving it through vision, strategy and top management commitment is a must for management innovation. Often this radical innovation can help achieve the organisational goals. In order to make changes to existing management practices and processes there must be a significant driver to justify the need for change.

The driver for a management innovation can come in various forms. It could be a significant business risk or threat to business viability, or managers might envisage a significant opportunity for performance gains. Effective leadership capability can articulate the issues, threats, performance gaps and opportunities and justify the need for a change. In most cases, performance gaps could be a lead indicator to promote management innovation for a radical change.

From the literature review in Chapter 2, sensing gaps, opportunities, technology needs and customer needs were discussed within theories on entrepreneurship, leadership and dynamic capability. Although these capabilities are described in the context of a generic theory of innovation, these capabilities can also be adopted for management innovation as management innovation is another kind of innovation. However, the suitability of these capabilities must be tested through empirical study.

Top management is the key to initiating and supporting the implementation of management innovation. Managers need to sense the opportunity and drive

management innovation. Theories on entrepreneurship, leadership and dynamic capability discuss sensing the need for innovations and seizing an opportunity. Capabilities from these topics are discussed in the following sections to establish the driving capabilities for management innovation.

3.2.1.1 Entrepreneurship perspective capabilities

According to Shane (2003) entrepreneurship is an individual ability to sensing opportunities by scanning markets, technology and customer needs. In addition, Neck & Manz (1996) note that entrepreneurs determine business opportunities for creating and delivering stakeholder value in prospective ventures. Similarly, Kor, Mahoney & Michael (2007b) claim that entrepreneurship capabilities determine the new opportunity sources and the capability to exploit such opportunities, including sensing the need for management innovation driven from technology and market forces. For example, Kor et al. (2007b) point out that entrepreneurs' sense dimension relates to seeing technological and market opportunities, and also sensing threats.

Leyden (2016b) suggests that public sector growth requires innovation and innovation can only occur through entrepreneurial action by having a creative environment, incentives, resources and feedback. In addition, according to Gregory, Elvernizzi & Romenti (2010), strategic communication is an important component of entrepreneurial organisation. Also entrepreneurs are risk takers for opportunity (Estay et al. 2013; Hsua et al. 2014). Entrepreneurial motivation and intention is strongly linked with risk taking capability (Nabi & Liñán 2013).

In summary, the entrepreneurial capabilities in an organisation involve sensing new opportunities. From a management innovation perspective, this translates to capabilities for sensing management innovation opportunities to change the business model, principle and practices. The literature also acknowledges that the development

of entrepreneurial capabilities enriches and reinforces the internal communication and strategic communication roles at various levels. The sensing dimension of entrepreneurship is focused on envisioning or seeing technological and market opportunities within the organisation. Sensing threats can also drive a management innovation. The literature review in Chapter 2 shows that an entrepreneurial capability in an organisation would be most effective in **sensing opportunity, top management communication and risk taking**.

3.2.1.2 Leadership perspective capabilities

Large organisations are complex to understand and management practices are difficult to change due to more complex organisational contexts and increased spatial separation (Vaccaro et al. 2012). Initiating change in larger organisations requires enormous effort due to bureaucratic formalisations (Koenea, Vogelaar & Soetersb 2002). Public sector leadership requires a strong outcome focus and stakeholder collaboration for innovation with other agencies. The public sector will no longer be able to succeed without stakeholder collaborations (Tizard 2012).

Leadership, at various levels of an organisation, plays a significant role in making changes. Management innovation requires strategic drivers and commitment to drive changes to current practices. These strategic drivers occur when top management senses the need for a management innovation due to performance gaps, or a significant opportunity to change the operating model or principle. By making use of the opportunity or issue, and desire for a significant change, executives are enabled to initiate the management innovation approach to drive further change rather than relying on the continuous improvement approach. From a leadership perspective, the management innovation approach requires looking for a novel idea rather than

analysing the root cause of the problem or opportunity.

Various leadership theories and models describe the driving capabilities for innovation in an organisation. For example, D'Amato & Roome (2009) have developed a process model of leadership for innovation, including direction, alignment and top management commitment. A similar model developed by Mumford et al. (2007a) includes defining problems, establishing the context and development solutions. Klein & Sorra (1996) insist that innovation requires active coordination and senior management commitment. Leadership theories suggest that innovation is dependent on establishing a problem, with senior management commitment and direction aligning to the business objective.

Top management has a prominent role within organisations, and also has the ability to greatly influence management innovation (Vaccaro et al. 2012). A strategic leadership style provides top management commitment to support innovation, and it is critical to make the capabilities available in the organisations (Bossink 2007). In large rail organisations top management commitment drives management innovation and organisations may support its facilitation by appointing a senior executive or general manager to further develop management innovation.

The influence of top management is critical to support and make capabilities available in the organisation (Norrgrén & Schaller 1999). Furthermore, Bossink (2007) insists that top management commitment and facilitation of innovation capabilities are the two most important aspects of strategic leadership. Alternatively, an interactive leadership style empowers employees and engages internal actors and external stakeholders to innovate (Eisenbach, Watson & Pillai 1999).

Researchers have focused on examining the influence of top management team diversity and knowledge on management innovation (Ling et al. 2008; Magni et al. 2009; Somech 2006). These studies concentrate on top management as a group of agents involved in the process of internal change who, due to the nature of their position, are capable of encouraging or discouraging management innovation. Top management sponsor major initiatives and appoint a general manager as the sponsor representative accountable for developing and delivering the initiative. This is also applicable for management innovation.

Transformational leadership capabilities play a significant role in driving management innovation. According to Sosik (1997) transformational leadership creates intellectual stimulation, and encourages staff to question the present management practices of an organisation. Transformational leadership indicates high confidence and expectations in the ability of the staff to deliver progressive solutions (Bass 1995; Jung, Chow & Wu 2003), empower staff and enable them to share innovative ideas (Hoch 2013). Transformational leadership has strong influence on innovation capabilities of strategic alliance than on the development of operational capabilities (Schweitzer 2014), and encourages staff to achieve targets using management methods, goals and rewarding staff when attaining goals (Vera & Crossan 2004).

Thus, from a leadership perspective the capabilities enabling the driving of management innovation include top management commitment, having clear vision and strategy, appointing an internal change agent and engaging stakeholders.

3.2.1.3 Dynamic capability perspective

Establishing reasons for management innovation is vital to justify and drive management innovation in large organisations. A strategic driver can support and strengthen the decision and the reason for management innovation. As defined by

Teece (2007a) in the dynamic capability model, sensing and shaping opportunity is an important capability that helps to reconfigure the tangible and intangible resources.

Zahra, Sapienza & Davidsson (2006) observe that dynamic capabilities are a significant way to determine new sources related to competitive advantages. Other studies have noted that development of dynamic capabilities could generate and sustain competitive advantages in an organisation efficiently (Rindova & Kotha 2001b). It entails a company's responses to environmental modifications (Teece et al. 1997b). This may include market uncertainty and managerial innovative performance influenced by dynamic capabilities (Collis & Montgomery 1995). Market uncertainty may not impact the growth of large rail organisations but private rail operators do bring a certain degree of competition in the rail service business. More private companies are providing rail maintenance and operations services. Therefore performance improvements and value adding are the key to driving management innovation in rail organisations.

According to Rindova & Kotha (2001a) dynamic capabilities are categorised based on their capacity to shape and sense threats and opportunities, to seize chances or opportunities and to sustain competitiveness through combining, enhancing and safeguarding when needed, and reconfiguring the leadership's tangible and intangible assets. Winter (2003) argues that dynamic capabilities can become operational capability if radical change is seen but can be a cost burden if they are improperly operationalised to the needed level. Management innovation impacts operational processes in that management innovation changes the way an organisation operates, therefore dynamic capability plays a significant role when a management innovation happens.

Dynamic capability is similar to entrepreneurial capabilities in terms of drivers for

management innovation such as **sensing opportunities and threats, and sensing technology needs**.

3.2.1.4 Construction of driving capabilities

From entrepreneurship, leadership and dynamic capability perspectives there are a number of capabilities that could act as drivers to enable the initiation and commitment to drive a management innovation forward. Figure 3.4 illustrates driving capabilities from the entrepreneurship, leadership and dynamic capability perspectives.

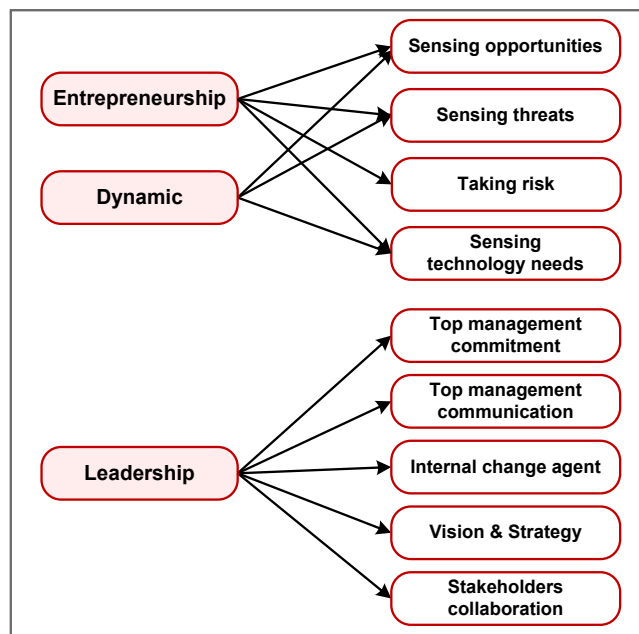


Figure 3.4: Driving capabilities

While there is no existing capability framework to provide guidance for initiating and driving management innovation, most large rail organisations rely on the less expensive and low-risk continuous improvement approach due to availability of capabilities such as resources, tools and proven processes. Although, as Morris (2007) observes, continuous improvement can help to standardise, rationalise and simplify and make things run smoothly, this approach may not help organisations to pursue radical improvements.

Innovation requires active coordination and senior management decision-making (Klein & Sorra 1996). Unless a senior executive is made responsible for introducing a new approach to make it possible to change the old ways and to further develop a novel idea, it is difficult to commit and drive a big change. Appointing an internal change agent sets an agenda to resolve a problem which cannot be resolved using an existing solution (Birkinshaw, Hamel, et al. 2008). Once the desire for management innovation is driven by a significant issue or performance gap, or significant opportunity, a clear vision, strategy and commitment to support enables the organisation to move forward. Appointing an internal change agent as the accountable manager enables the management innovation to proceed to the next stage, the development stage.

3.2.2 Developing capabilities for management innovation B

Once top management is committed to proceeding with a management innovation, they support progress to the development stage, and further develop the novel idea into practical solutions. The most important capabilities to develop the management innovation include resource capability, a new methodology and knowledge sharing. The literature review in Chapter 2 showed that dynamic capability, knowledge management and leadership theories discuss the capabilities required for the developing stage of management innovation.

3.2.2.1 Dynamic capability perspective

Reconfiguring resources to respond to the need for changing opportunities is known as dynamic capability that enables firms to innovate and to create competitiveness (Jianwen, Jill & Ma 2009). Dynamic capability enables firms to develop resources from the internal and external environments as combined capabilities (Weeks 2009). Making resources available is important for creating a new management innovation,

however it is also important to have a methodology available for the resources to innovate and collaborate and to achieve the desired outcome.

According to Birkinshaw, Hamel, et al. (2008), the outcome of management innovation is a system development rather than a tangible output such as a technological innovation. A new system development for a management practice is difficult to observe. Often it is overlooked by product and process innovation (Mol & Birkinshaw 2006), or the focus is on the issue as the management innovation works in the background as a problem is being addressed, or a significant opportunity being realised. Resolving a critical issue or a breakthrough cannot be achieved without management changing old ways and doing something different. A new methodology is required to change old management practices.

Collaboration is another important dynamic capability, including customer engagement, entrepreneurial alertness, collaborative agility and collaborative learning (Agarwal & Selen 2009). Collaboration increases stakeholder engagement through stakeholder dialogue and stakeholder knowledge (Ayuso, Rodríguez & Ricart 2006b). To overcome the problem of management 'silos', rail organisations require significant levels of collaboration for management innovation. It is important to engage appropriate stakeholders to ensure their requirements are captured and their knowledge is shared so they are also part of the development process and they accept and support it, and the outcome meets stakeholder needs.

From both a reconfiguration and collaboration viewpoint, Weeks (2009) noted that dynamic capability allows firms to develop the internal and external environment. Sharing external and internal knowledge and information allows organisations to go beyond process and product innovation. Knowledge and information sharing through collaboration enables large organisations to develop a management innovation by

changing the dynamism of their regular work environment and collaborating with new resources.

From a dynamic capability perspective, the important capabilities for the development of management innovation are **reconfiguring resources** and **collaborating with stakeholders**.

3.2.2.2 Leadership perspective capabilities

Various leadership capabilities, in terms of establishing process, roles and responsibilities, play a significant role in the management innovation development stage. For example, charismatic leadership focuses on providing a process for innovation (Barczak & Wilemon 1989; Nadler & Tushman 1990), and influencing employees (Lee et al. 2015a). Instrumental leadership also supports the innovation process (Nadler & Tushman 1990). A process or methodology is vital for development of the management innovation initial concept to a potential solution. For management innovation Mol & Birkinshaw (2006) and Hamel (2006) recommend that a systematic approach encompassing processes and methods is required to further develop a management idea into practice.

Transformational leadership empowers team members to challenge existing management processes or practices (Avolio et al. 1999) and also influence the change (Ross & Gray 1997b, 1997a), motivates employees to attain organisational goals (Bass et al. 2003), and inspires, influences and stimulates intellect (Rowold & Heinitz 2007). Similarly interactive leadership encourages participants to share information (Kazemek 1991; Lee et al. 2015b).

The important leadership capabilities for developing management innovation include **providing processes, motivation and facilitation**.

3.2.2.3 Knowledge management perspective capabilities

Once the change methodology is finalised, a team should be ready to use the methodology and share knowledge to develop a management innovation idea to a potential solution. Internal change agents communicate constantly and try out a proposed new conceptual idea by evaluating its progress from the original idea or intent (Birkinshaw, Hamel, et al. 2008). Amabile et al. (1996) suggest that the role of innovation is to transform ideas into something usable and profitable, in terms of public service the profit can be understood as improved and cost effective customer service.

Sharing tacit knowledge is key to innovation, and knowledge sheds light on creativity, learning and change (Howells 1996; Nonaka & Kenney 1991a). Sharing knowledge for management innovation by using a pilot project with a taskforce trying to achieve the objectives helps to develop a model and process, and refine the methodology. Fedor et al. (2003) point out that knowledge is considered the key ingredient of a company's innovation behaviour and Zahra & George (2002) infer that the transformation of knowledge reflects the ability of an organisation to consolidate new knowledge with existing knowledge.

According to Holtshouse (1999), knowledge flows between and among people within an organisation in social, cultural and environmental conditions. Tacit knowledge normally disperses through social networks where people share information within and between organisations. However, knowledge sharing alone is inadequate without an understanding of how to use the knowledge or idea. As Nonaka & Konno (1998) advocate, knowledge needs to be shared and articulated.

From a knowledge management perspective, important capabilities for developing management innovation include **sharing tacit knowledge, articulating knowledge,**

motivating staff to share ideas and **generating new knowledge**, while sharing explicit knowledge may add value in setting the context or keeping up with the emerging technology.

3.2.2.4 Construction of development capabilities

Organisations require three institutional capabilities to initiate and implement innovations: capability to generate ideas, capability to develop new products and capability to add value for customers (Parsons 1991). Novel thinking that makes a significant shift to management practices can be regarded as management innovation. This happens when management is confronted with significant problems that demand fresh thinking and it is essential for management innovation for long-term advantage (Hamel 2006; Mol & Birkinshaw 2006).

A novel management innovation idea can be further developed in the development stage to introduce new management practices, where management believes that major strategic changes can add value to the stakeholders. Capabilities that enable the development stage are predominantly discussed in the dynamic capability, leadership and knowledge management theories, as illustrated in Figure 3.5 below. These capabilities can enable progress from the driving stage of the management innovation initiatives to the development stage to invent a solution to the issue or realise an opportunity that could provide a management innovation outcome.

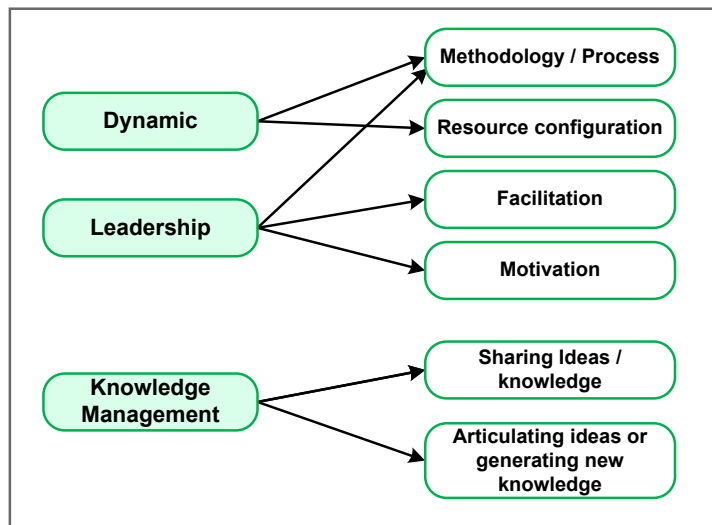


Figure 3.5: Developing stage capabilities

Thus, for the management innovation development stage, the concept of dynamic capability provides resources to further develop the concept by sharing knowledge to develop new knowledge and the leadership provides process and methodology to facilitate management innovation collaborations.

3.2.3 Diffusing capabilities for management innovation C

The diffusing stage has two components: deployment of the new management innovation outcome; and diffusion of the same methodology to other situations which become a new program as a result of the invention. Hamel (2006) suggests that management innovation process and methodology become part of an ongoing program of invention. However deploying the outcome of the management innovation as well as the ongoing program requires multiple capabilities including organisational climate, awareness and communication, methodology, project management, program and governance. These capabilities are discussed in various leadership and organisational theories discussed next.

3.2.3.1 Leadership

Transformational leadership is associated with innovation culture (Songkhla 2014).

However, the scope of this research is focused on management innovation where executives drive the change rather than bottom-up innovation where culture plays a significant role. Organisational climate is important to implement the change and findings from other studies suggest that transformational leadership creates a climate for creativity (Kim & Yoon 2015). For deployment, it is important that people understand the purpose of change due to management innovation and adopt the changes. Leaders should create the environment for change. In other words, leaders create a new practice and influence the change.

Corporate culture and organisational climate enable a firm to adapt to new situations and challenges, and influence the behaviour of staff, as they share values and beliefs (Sheih & Wang 2010). The organisational context is vital for facilitating or inhibiting new ideas and influencing employees' reactions to change (Birkinshaw, Hamel, et al. 2008). The context could be organisational factors and climate influencing the adoption of any management innovation (Hsieh 2011). Organisational climate for management innovation is an important capability to implement a new management innovation. This includes situation and timing and other factors that underpin the situation that are the enablers for management innovation.

Leadership theories in the literature focused strongly on motivation. For example, charismatic leadership motivates staff (Bossink 2007; Nadler & Tushman 1990). Motivation could arise from either a big problem or an opportunity. Adapting to the situation and introducing management innovation is also supported by many researchers (Birkinshaw, Hamal & Mol 2008; Hamel & Breen 2007a; Hsieh 2011; Rindova & Kotha 2001a; Sheih & Wang 2010).

Top management communication is one of the most important capabilities for implementing management innovation, and it plays a significant role for innovation

Ackermann (2013). When top management communicate through shared goals they create shared thinking and encourage working towards one goal (Jaatinen, Södergård & Peuhkurinen 2005; Mäkelä 2002). In addition Pfeffermann & Hülsmann (2011) claim that the communication of innovation is a key component of a firm's cross-functional dynamic capabilities. Communication also establishes the interface between an organisation and its stakeholders, and plays a major role in the development and success of an organisation (Keramati & Azadeh 2007; Luoma-aho & Halonen 2010; Moenaert et al. 2000).

3.2.3.2 Support system perspective capabilities

The diffusing stage includes the deployment of the management innovation outcome as a result of a specific driver and, at the same time, the same concept or outcome can be diffused to other situations. To deploy management innovation effectively, support systems capabilities such as continuous improvement programs such as Six Sigma and Total Quality Management may have a role along with organisational culture and climate and project management to project manage the management innovation initiatives.

Researchers argue that Six Sigma increases efficiency (Benner & Tushman 2003b), and has a positive relationship with innovation (Daniel & Amrik 2003), while others argue that Total Quality Management and Six Sigma hinder innovation (Glynn 1996; Slater & Narver 1998). However researchers also agree that Six Sigma and Total Quality Management help to establish a positive climate for change (Panuwatwanich et al. 2008b). Total Quality Management and Six Sigma provide tools and methodology for continuous improvement, though not for radical improvement. It is also worth noting that Total Quality Management and Six Sigma are based on a scientific approach, relying on data, evidence and analysis, whereas innovation is a novel approach, and

management innovation is based on changes to principles, concepts and management values using novel principles.

In contrast to continuous improvement systems, project management methodology is used for implementing management innovation outcomes. Snee & Hoerl (2005) suggest project management activities include planning the work, estimating and obtaining resources needed to complete the work, assessing the risk, directing execution, organising the work and analysing the outcomes. Similarly research by Iakovleva (2014) notes that innovation is implemented mostly through projects. Project management methodology can assist in deploying a management innovation outcome, including scoping the project, planning a project, managing funding and delivery.

As part of project management methodology, multiple innovation projects can be managed as an innovation project portfolio (Killen et al. 2008; Spieth & Lerch 2014). Similarly Filippov & Mooi (2010) claim that development of innovation is run like a project and there is significant interplay between innovation and project management. When multiple projects are managed, innovations must be evaluated and prioritised. Project management contributes to major variables such as cost, quality, risk and scope. Project management attempts to identify the time needed to finish each and every task and frame a schedule for finishing the task. Implementing a management innovation outcome requires using project management methodology.

3.2.3.3 Construction of diffusion capabilities

Diffusing management innovation may take several years. Initially, a management innovation outcome should be implemented, and once the outcome is successfully implemented, the same methodology can be applied to other situations. To deploy a management innovation requires a receptive organisational climate to ensure there is

less resistance to change. Because a management innovation has potential to make a major change in an organisation, communication about the purpose of the change from top management is vital.

Thus, diffusing management innovation requires a receptive climate, top management communication, staff motivation and project management.

Figure 3.6 illustrates these diffusing capabilities from leadership and support systems perspectives.

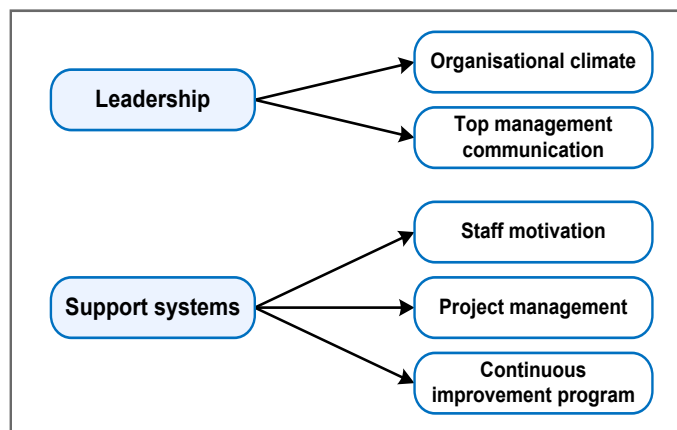


Figure 3.6: Diffusing capabilities

3.3 Proposed management innovation capability framework

The three stages of management innovation need driving, developing and diffusing enabled to align the capabilities discussed from various leadership and organisational theories including entrepreneurship, leadership, dynamic capabilities, knowledge management and support systems.

Building management innovation capability requires combined capabilities. Entrepreneurship capabilities are required to sense opportunity or leverage problematic issues, and initiate innovation. Once the decision is made to innovate,

leadership capabilities are required to provide management commitment to innovate and communicate the need, and support the development of ideas for specific needs using a knowledge creation capability and/or dynamic capability to develop innovative solutions. Once developed, the solution can be implemented using support system capabilities using a receptive climate of the organisation to sustain a management innovation.

Management innovation capability is a vital management tool for creating significant improvements to organisational and strategic needs, with subsequent improvements in performance and/or benefits for customers. The literature suggests that management innovation can make radical improvements, and the theoretical model developed in this chapter identifies a framework for making radical improvements based on management innovation capabilities. The purpose of the proposed Management Innovation Capability Framework is to assist large rail organisations and similar public sector to build a capability to develop and deploy innovation and make radical improvements and/or eliminate significant organisational issues. The Management Innovation Capability Framework is shown in Figure 3.7.

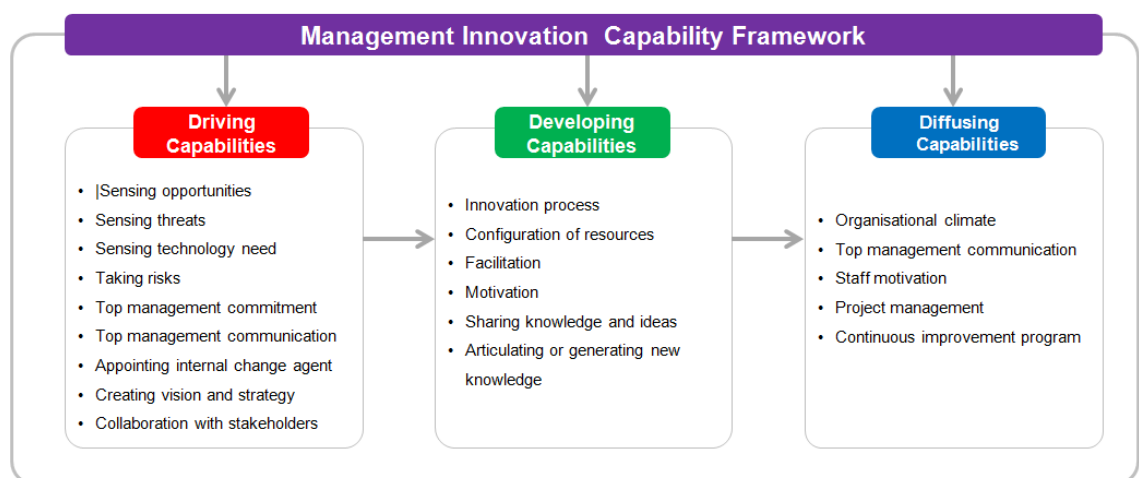


Figure 3.7: Management Innovation Capability Framework

Figure 3.7 proposes a framework of capabilities that enables rail organisations to implement management innovation. Based on the literature, the framework integrates evidence on the capabilities that enable organisations to drive, develop and diffuse management innovation.

3.4 Chapter summary

This chapter has outlined theoretical framework constructed using literature discussed in chapter 2 and proposed Management Innovation Capability Framework using three stages including driving, developing and diffusing. The research design including research questions to test the framework is discussed in Chapter 4.

4 Research Design and Methodology

4.1 Introduction

Chapter 2 reviewed research in the areas of entrepreneurship, leadership, dynamic capability, knowledge management and support systems, and Chapter 3 presented the proposed research model to identify capabilities that can enable management innovation in large rail organisations. This chapter presents the philosophical and methodological framework, research approach, methodology justification, research design, and methods explaining data collection, data analysis, validity and reliability and ethical considerations. Figure 4.1 shows the structure of the chapter.

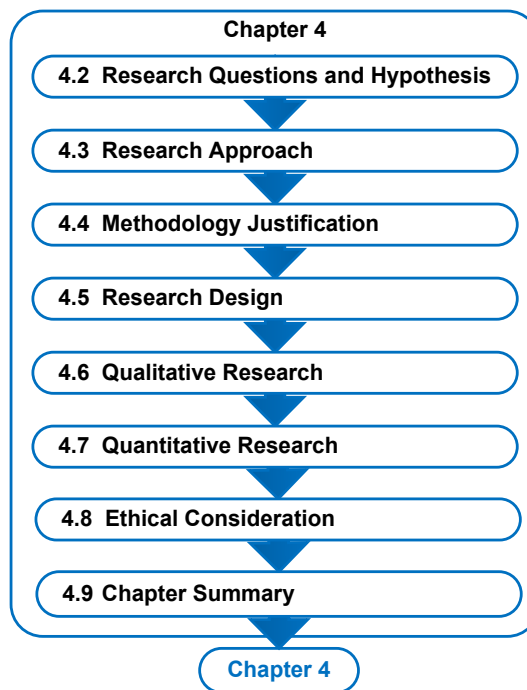


Figure 4.1: Outline of Chapter 4

4.2 Research question

The central research question for this thesis is:

How can management innovation capabilities be built in large rail organisations?

To address this question, there are four subsidiary research questions:

- 1) How is management innovation driven in large rail organisations?
- 2) How is a management innovation developed as a new concept?
- 3) How is the outcome of management innovation implemented and diffused to other situations?
- 4) How these capabilities are aligned to the management innovation capability framework that can be used as a guide to implement management innovation in large rail organisations?

4.2.1 Hypotheses

Hypothesis 1: Sensing opportunities or threats enables top management to initiate management innovation in large rail organisations.

Hypothesis 2: Top management commitment drives management innovation forward in large rail organisations.

Hypothesis 3: Process, resources, facilitation and idea generation enable the invention of management innovation.

Hypothesis 4: Staff motivation, communication and the organisational environment enable the deployment of management innovation.

Hypothesis 5: The outcome of management innovation benefits organisations.

4.3 Research approach

According to Johnston (2014), the term ‘research approach’ is widely used to indicate how a researcher undertakes the research activity and why they undertake it in a particular way. Research can be approached using two principles: epistemology and ontology.

Epistemology, as a technical term in philosophy, relates to the question of ‘how do we know’ and the relationship between the knower and the known, whereas ontology relates to what exists and the nature of reality (Maxwell et al. 2011). Alternatively, it can be said that while epistemology focuses on how the social world is studied, ontology focuses on the nature of social phenomena (Bryman & Bell 2015).

As management innovation capability is yet to be fully explored, a phenomenological approach is used to examine how these capabilities are aligned to various stages of management innovation that can assist large rail organisations to adapt management innovation and benefit. A mixed method is used in this research. The justification to use a mixed methodology and appropriate data collection methods are discussed next.

4.3.1 Mixed methods approach

The mixed methods approach draws from positivism and constructivism. Mixed methodology is the combination of multiple methodologies in the study of the same phenomenon (Denzin 2010), gathering information pertaining to the same phenomenon through more than one method (Kopinak 1999), cited in (Abro, Khurshid

& Aamir 2015). Mixed methodology uses both qualitative and quantitative approaches in a single project (Cameron 2009; Creswell & Clark 2007). Mixed methods refer to the collection and analysis of both qualitative and quantitative data (Creswell 2014). Qualitative and quantitative methodologies have their strengths and weaknesses (Abro et al. 2015), and weakness in one methodology can be compensated by the other methodology. Combining both qualitative and quantitative methodologies is common in academic research (Teddlie & Tashakkori 2010). De Kock (2015) found that in many cases the two approaches, steered in combination and harmony, provide rigour in academic research.

In mixed methods research two or more methodologies are employed either concurrently or sequentially. The concurrent approach has no priority and both qualitative and quantitative methods can happen simultaneously. The sequential approach has either the qualitative method first if the problem needs exploring or the quantitative method first if a test is required before exploring a few cases in more depth (Creswell et al. 2003). In a sequential procedure the researcher has the advantage of enhancing the findings of one method by using another method (De Kock 2015).

4.3.2 Applying mixed methods

The approach and advantage of using mixed methods is explained above. This section explains the adoption of mixed methods for this research. The objective of this research is to explore the capabilities that enable large organisations to build management innovation. Capabilities discussed in leadership and organisational theories for generic innovation have been identified and constructed as a theoretical framework as the capabilities for management innovation for large rail organisations is not yet conceptualised. Therefore further exploration is required using a qualitative

method first to strengthen the research model and then the research model can be validated using a quantitative method. Hence the best fit methodology is sequential mixed methods (Creswell et al. 2003).

Qualitative research focuses on experiences by people in a real situation that make sense of the case topic being researched. As such, Yin (2003) suggests that a case study design should focus on answering 'how' and 'why' questions, without manipulating the behaviour of those involved in the study. To understand the research objective and to find answers to the research question and subsidiary research questions, the data collection methodology should enable the researcher to collect appropriate original data. The original data should be collected from the experience of the parties involved in a natural setting, understanding the social phenomenon.

Using qualitative research allows examining individual perspectives in depth to explore management innovation capabilities and assemble pieces of information from selected cases. A case study research strategy helps with understanding the dynamics present in a single setting (Eisenhardt 1989b), and multiple case studies can provide numerous sources of evidence (Zainal 2007). The three cases studied in this research can help achieve the research objective and provide better understanding of the research question.

The purpose of this research is to build a capability framework for management innovation using qualitative and quantitative research methodology. According to SnelsonAtlanta (2017), it is common to use a combination of qualitative and quantitative methods. The case study supports the exploratory phase and the case study findings assist in constructing a robust model for the Management Innovation Capability Framework. Quantitative analysis enables validation and statistical testing of the model to understand the statistical relationship amongst the variables, whether

the variables are positively correlated or negatively correlated, and to confirm the final model for the Management Innovation Capability Framework for large rail organisations.

4.4 Methodology justification

4.4.1 Justification for the use of case study method

Given the research topic is under conceptualisation, a case study method is appropriate. This section provides several reasons to justify why case study is appropriate over other qualitative methods.

There are three common data collection methods in qualitative research including in-depth interviews, observation and focus groups (Ring, Jepson & Ritchie 2011). Each method is suited for the specific type of data to be collected. The in-depth interview method is optimal for collecting data to understand the social and psychological processes that have occurred in a particular setting, involving individuals' perspectives, personal experience and histories. Observation is appropriate for collecting data in natural occurring behaviours in their casual contexts and it is a lengthy process of descriptive notes of what is happening. The focus group method is appropriate when broad overviews of phenomena require collective discussions to understand the behaviours and opinions in particular circumstances (Walters 2001).

The focus group method can be costly and it can be difficult to convene and assemble appropriate participants when needed (Hancock, Ockleford & Windridge 1998). As this research is focused on senior management, and their availability to attend focus group meetings may be limited, the focus group method is not an appropriate method for this research.

The observation method can be used when data cannot be collected through other means, or data collected through other means are of limited value or difficult to validate and it is important to observe the environment (Hancock et al. 1998). Management innovation is not a continuous process, it happens in between business-as-usual and over a long period through meetings and workshops, and individuals thinking and conceptualising. Therefore observation is not an appropriate method for this research.

Case study research is usually used for unobservable perceptions. Case study is 'an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident' (Yin 1994, p. 13). Eisenhardt (1989b) defines the case study as a research strategy which focuses on understanding the dynamics present within single settings. Also, Gillham (2000) suggests that a case study is a human activity embedded in the real world that can be studied or understood in a context. Realism is more appropriate with the case study method.

The case study research method is used to explore answers to a specific research question. Case studies can be used to provide a description (Kiddler 1982), test a theory (Eisenhardt 1989b), or generate a theory (Gersick 1988). The theoretical research model is based on the capabilities borrowed from leadership and organisational theories that are relevant to generic innovation. The theoretical research model can be tested and expanded by exploring the experience of individuals in a social and psychological process that has occurred in a particular setting. This can be achieved by selecting appropriate cases and interviewing appropriate participants, therefore the case study method is most appropriate for this research.

The case study methodology is consistent with other innovation and other

management studies conducted in the public sector. For example, Von der Heide & Charles (2009) studied Australian rail industry environmental regulation using qualitative and quantitative mixed methodology, Koowattanachai (2011) used mixed methods to study investment in the Australian rail freight sector, Klimentova (2014) used a case study approach to measure public sector innovation in 12 Luxembourg public organisations, Michaelides (2011) used case study for the art of innovation in the public sector, and Quinn & Courtney (2016) used case study methods to study the public sector entrepreneurial role in communities. Using a mixed methodology with the case study research method in public sector organisations is not new and has been shown to be appropriate in social research in public sector organisations.

4.4.2 Justification for the use of survey research

Survey research provides three distinct characteristics including quantitative descriptions, structured and pre-defined questions and ability to generalise the findings to the population (Michayluk, Kent Baker & Mukherjee 2007).

Technology such as using the internet for survey research increases the usability, improves the quality and accuracy of data or information collected, enables data analysis and reduces the cost of research (Tirres 2016). Obtaining a large population sample is possible with survey research and it can elicit information about attitudes (Glasow 2005).

This research requires people's experience and attitude towards adopting management innovation, therefore survey research is an appropriate quantitative research method to capture people's experience and beliefs. An internet-based survey makes it easy for the respondents to complete the survey when time permits. The

geographical location of respondents is not an issue in conducting online surveys.

The survey research method can collect data to test the pre-determined hypotheses using statistical techniques and quantitative analysis can confirm or reject hypotheses (Brief 2012). This research requires testing hypothesis using statistical techniques to confirm or reject the proposed Management Innovation Capability Framework.

Survey research in the public sector and rail service organisations is a common practice. For instance, Hart (2013) studied the measurement of safety culture in eight rail organisations in Australia using the survey method.

4.5 Research design

The previous section demonstrated why the sequential mixed methodology of qualitative and then quantitative methods is appropriate for this research and justified the need to use the case study method to explore the innovation capabilities to build on the theoretical model discussed in Chapter 3 and then validate the model using the survey research method.

Case studies can be used to generate theory from the evidence (Eisenhardt 1989b) and the case study method allows researchers to retain the holistic and meaningful characteristics of real-life events, such as individual life cycles, organisational and managerial processes, neighbourhood change, international relations, and the maturation of industries (Yin 2003). Therefore, a case study can be described as a study of an individual or a group, involving an in-depth examination from various perspectives by systematically collecting data, analysing information, finding answers to research questions and reporting results.

Case studies can be undertaken using a semi-structured questionnaire to allow participants to relate their experiences without any restrictions. Lather (2006) notes that an 'open-ended' question cannot be answered with 'yes' or 'no', and an individual must respond to the questions in their own words. On the other hand, Bryman, Becker & Sempik (2008) notes that 'closed-ended' questions are those which have their own predetermined set responses. Closed-ended questionnaires are used for input to quantitative analysis. Therefore, this research used qualitative research via the case study method to collect data using an open-ended questionnaire.

The main research question for the case studies is 'How can large rail organisations build capability for management innovation?'. To explore management innovation capabilities for the driving, development and diffusion stages, 22 sub-questions were developed. Three case studies were selected for this research from three large rail organisation in three big cities of Australia.

Data collected from the three case studies were analysed individually and then all three cases were analysed to understand the similarities and differences and determine the Management Innovation Capability Framework and associated capabilities for each stage. Based on the outcome of the case studies, quantitative analysis was used. The purpose of quantitative analysis is to validate the Management Innovation Capability Framework.

Quantitative research is an empirical research where data are in number forms (Punch 1998). Similarly Gall, Gall & Borg (1999) suggest that quantitative research relies heavily on numerical data and statistical analysis. Data for quantitative analysis can be collected by a survey method. The choice of survey media can be written, verbal or mixed mode. This research used the written mode with an online survey. Survey instrument development should ensure the study is carefully defined, translated into

measurable factors, contributes to the objective (Glasow 2005).

A survey should be short and focused, and able to be filled out within a few minutes, as participants are unlikely to fill out a lengthy survey with too many questions (Driscoll 2011). A pilot study can improve the quality and efficiency of the main study, reveal logistics issues and identify modifications needed to the main study (Hazzsi & Maldaon 2015). Therefore a pilot study was conducted to ensure the survey, tools and process are reliable and appropriate to meet the research objectives.

In quantitative research, the survey method is used to collect data, which is analysed to understand the statistical relationship amongst the variables, and whether the variables are positively or negatively correlated. To validate the Management Innovation Capability Framework, descriptive analysis is used to transform and rearrange the raw data into a form that is easy to understand and interpret (Zikmund 2003), and confirmatory factor analysis, a type of structural equation modelling, is used for further analysis. Confirmatory factor analysis enable to measure and test models and it is a commonly used statistical procedure (Brown 2014). Research model fit and structural relationship can be statistically tested and validated (Jöreskog & Sörbom 1996).

4.6 Qualitative research

The case study research is justified as an appropriate qualitative method for this research. This section provides detailed information on the research organisations, participants' profile, criteria for the selection of case studies, sampling plan, qualitative data analysis, and data validity and reliability.

4.6.1 Research organisations

According to Edmondson & McManus (2007), field research in management is a systematic study that relies on the collection of original data in real organisations. Three large rail organisations based in the three largest Australian cities, Sydney, Melbourne and Brisbane, participated in the field research. These firms provide rail services to large metropolitan cities or freight services to Australia. The selected organisations are run by government or private–government partnerships and are overseen by the state minister of transport. Table 4.2 provides an overview of the participating organisations. While the organisations were happy to participate in the research they have not been named because of confidentiality reasons.

Table 4.1: Characteristics of the three research organisations

Organisation	Number of employees	Location	Infrastructure	Services
1. Large rail organisation Brisbane	5,000	Brisbane, Queensland	2,300 km of rail	Rail freight services
2. Large rail organisation Melbourne	3,800	Melbourne, Victoria	830 km of track 212 stations	Rail passenger services
3. Large rail organisation Sydney	10,000	Sydney, NSW	369 km of rail (Sydney) and 721 km NSW 307 stations	Rail passenger services

4.6.2 Participants

Each of the participating organisations had a sponsoring manager at a general manager level for the researcher to liaise with. Research participants from each of the participating organisations were selected by the sponsoring general manager based on management level, from level 1 to level 5 as described in Table 4.3 below. As

management innovation occurs at the senior management level, to obtain good insight into the case studies and high quality information, participants were at senior management level.

Table 4.3: Characteristics of participants

Organisation	Management level	Title	Reporting to	Government grade
Organisation 1	L2 Manager	Executive Director / Vice President	Chief Executive / President	Senior Service
Organisation 2	L3 Manager	Director / General Manager	Executive Director / Vice President	Senior Service
Organisation 3	L4 Manager	Senior Manager	Director / General Manager	Senior Service

The sponsoring general manager ensured that the selected participants had a good understanding and knowledge of the selected case study and innovation that made major changes to management practices.

4.6.3 Selecting the case studies

According to Flyvbjerg (2006), cases can be selected for case studies either randomly or through an information-oriented approach. Random selection is used to avoid systematic biases in the sample. However, the selected case study should also be appropriate to the topic being researched, otherwise the quality of information may affect the results. Information-oriented selection is used to select cases based on expectations about their information content. This approach uses maximum information from small samples and single cases.

An exploratory and multiple-case studies approach (Yin 2003) was used in this research to explore comparisons of results within and between cases. The case studies selected for this research use information from a single case from each of the three large rail

organisations. These case studies were selected in consultation with the general managers to ensure the cases were appropriate to satisfy the research objectives.

Criteria to select case studies included audience, intended beneficiary, topic of interest, relevance and quality of information, industry sector, size, location, number of sites and percentage of workforce and type of cases (Gerring & Seawright 2015). Techniques of case selection include typical, diverse, extreme, deviant, influential, crucial, pathway most similar and most different (Gerring 2004). The following criteria were used as a guide to select an appropriate case study in each of the three participating organisations.

- Industry selection: Public sector or government or overseen by the government department, large organisation with thousands of employees, located in a major Australian city.
- Typical case selection: There were significant changes made to a management process that drives a significant change and benefits to the organisation.
- Influence innovation: Executives were driving an innovative approach for a new management model using a novel approach which was subsequently used for a number of changes in the organisation; or taking a novel approach to resolve a significant issue.
- Innovative approach: Management adopted an innovative approach to resolve a significant problem rather than traditional problem solving methodologies.
- Extreme change: A change was driven by a new management philosophy that initiated a range of extreme changes and significant benefits to the organisation.
- Most different: Case studies were selected from safety, maintenance and customer service to avoid content biased results.
- Based on the above criteria, three case studies were selected from the three participating large rail organisations from three major cities of Australia including Sydney, Melbourne and Brisbane. The case studies include eliminating level crossing incidents as a safety focused initiative, establishing a

Centre of Excellence as a train maintenance initiative and introducing a customer service model as a customer focused initiative.

4.6.4 Sample plan

The sample size for each case study was calculated based on recommendations by the Australian National Centre for Research Method review paper (Baker, Edwards & Doidge 2012). Overall, 36 interviews were conducted across the three large rail organisations, with 11, 12 and 13 interviews conducted at each of the participating organisations. The participants included executives, directors, general managers and senior managers. The participants included both male and female managers. The interviews were semi-structured and the duration was between 30 and 45 minutes. All participating organisations were personally visited by the researcher and the interviews were face-to-face, except for one telephone interview.

4.6.5 Qualitative data analysis

Case studies usually generate much information to analyse. Eisenhardt (1989b) suggests three strategies to deal with the volume of information including selecting categories or dimensions, selecting pairs of cases, listing similarities and differences and dividing data by the data source. This research categorises the data based on the capabilities discussed in the theoretical model, including driving capabilities, development capabilities and diffusion capabilities and each of the three stages has enabling capabilities as sub-categories.

NVivo qualitative analysis tool was used to organise and analyse the data. All the interviews were recorded and transcribed and loaded into *NVivo*. The categories and sub-categories which are capabilities and enablers were coded in *NVivo*. The researcher analysed the participant responses and added the right categories and sub-

categories to enable the analysis.

4.6.6 Qualitative data validity and reliability

Validity in quantitative research means appropriateness of tools, process, whether the research question is valid to the desired outcome, appropriate choice of methodology, appropriateness of sampling data, analysis and valid results and conclusion (Leung 2015). There are three types of validity: construct validity, internal validity and external validity. Construct validity is establishing operational measures for the concepts being studied, internal validity is the causal relationship where a certain condition leads to other conditions and external validity is establishing the domain to which the study findings can be generalised. Face validity is part of construct validity. The researcher constructed the questionnaire for the semi-structured interviews based on the theoretical model and checked whether face validity is appropriate to the qualitative analysis. Content validity is another type of construct validity. An extensive literature review was conducted across several topics and a theoretical model was developed to ensure the construct covers all the variables and the variables were tested for internal validity using quantitative research.

Reliability is the capability of the data collection procedure to repeat the same results (Cohen 2006; Yin 2003). All participants for both qualitative and quantitative research were selected by the sponsoring general manager to ensure the right level of management staff is selected and the quality of information is reliable, consistent and not biased. All interviews were conducted individually in a closed office to ensure information provided by the participants was not affected by the environment and adequate time was provided to the participants.

4.7 Quantitative research

The survey research method is justified as an appropriate method for this research. This section provides detailed information on the quantitative data collection method, data analysis, and data validity and reliability for quantitative research.

4.7.1 Quantitative data collection

A research survey was conducted using the questionnaire in Appendix B. Careful design of the survey questionnaire enabled respondents to answer close to the true value (Tirres 2016). Respondents should be able to understand the terminology of the survey questionnaire (Caprara, Barbaranelli & Guido 2001). In-depth case studies and cross-case study analysis provided a valuable insight into how the capabilities are aligned to a Management Innovation Capability Framework. This approach enabled the development of an appropriate survey instrument, which is reliable and can help validate the proposed Management Innovation Capability Framework.

From the case study results, it was evident that management innovation happens at executive and senior management levels. Therefore, the survey was targeted at this level. The respondents' management level is the same as the qualitative research. The respondents including executive directors, directors, general managers and senior managers from three large rail organisations participating in this research.

4.7.2 Sample size

According to Glasow (2005) the determination of sample size depends on five factors including desired degree of precision, relevant units of analysis, required statistical

power, ability to gain access to the study subjects, and degree to which the population can be stratified. The sample size was calculated using the Australian National Statistical Service (NSS 2013) sampling size calculator. Based on a population of 800 executives, general manager and senior managers across all three participating organisation and a 95% confidence level, the sample size is 103 executives, general managers and senior managers. A total of 70 responses were received from the 103 managers invited to participate, for a response rate of 68%.

4.7.3 Data preparation

There was a very small amount of random missing data from the survey response. According to Roth (1994), missing data can be a problem; it can reduce the power of the statistical analyses or bias the results by reducing correlations (Paulraj, 2002). There were 70 individual responses at executive, general manager and senior manager level, only 9 data entry were missing. AMOS requires no missing data for measurement models, therefore missing value analysis using expectation maximisation treatment of missing data was used (Little and Rubin, 1987). Missing values were then predicted based on other variables which were not missing, thus all missing values were replaced, prior to submitting the data to AMOS.

4.7.4 Quantitative data analysis

According to Creswell (1994) analysis explains phenomena by collecting numerical data, and analysing data using mathematical and statistical methods. This research uses the data collected by survey research and analyses the data using descriptive and confirmatory analysis techniques.

4.7.4.1 Descriptive analysis

Descriptive analysis provides a summary of information about data. Descriptive statistics are performed by analysing one variable at a time (univariate analysis). Descriptive statistical analysis is performed by analysing the variables in a data set using frequency tables, measures of central tendencies, measures of variability (range and standard deviation) and variance (Patel 2009).

Descriptive analysis is used in this research to obtain detailed descriptions of the management innovation capabilities using primary data in the form of figures or visual description, standard deviations and correlations.

4.7.4.2 Confirmatory analysis

Confirmatory factor analysis uses hypotheses to test variables and covariance (Schreiber et al. 2006). Structural equation modelling is a powerful tool of data analysis and causal modelling (Barrett 2007) used as a quantitative method for confirmatory analysis. This research uses structural equation modelling to analyse several confirmatory tests including chi-square test, Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA) and testing hypotheses (Suhr 2006).

4.7.5 Quantitative data validity and reliability

The three types of validity including construct validity, internal validity and external validity (Gibbert, Ruigrok & Wicki 2008; Glasow 2005) discussed in the qualitative data validity also apply to quantitative data validity. The survey instrument was constructed based on the research model and structural equation modelling was used to check the interrelationship of the variables to ensure internal validity. An appropriate sample was selected to generalise the research to ensure external validity.

Reliability should provide similar information if the research is repeated by different

people, or at a different time (Roberts, Priest & Traynor 2006). Reliability should minimise error and bias. To minimise bias, the participants were selected by the general managers who sponsored the research in each organisation, not by the researcher. Survey was conducted online and adequate time was given to the participants to ensure they had time to properly complete the survey instrument.

4.8 Ethical considerations

As this research involved human participants during the empirical study for interviews and survey data collection, ethics approval for this research was granted by the UTS Human Research Ethics Committee according to the UTS Ethics Policy and Guidelines, with approval number UTS HREC Ref No. 2013000241.

4.9 Chapter summary

To answer the central research question a mixed methods approach was used with qualitative and quantitative data collected from senior managers in three large rail organisations. Three case studies were used for qualitative research with a sample size of 36 executive directors, directors, general managers and senior managers from three large rail organisations in Australian cities. A survey was used for quantitative analysis, with 70 participants out of 800 eligible managers in the three rail organisations. The case studies were analysed individually followed by comparative analysis of all three cases. The survey research was analysed using confirmatory factor analysis. The findings are reported in the next chapter.

5 Results – Qualitative and Quantitative

5.1 Introduction

This chapter presents the empirical findings of this thesis from the qualitative research of three case studies and quantitative research from the survey. The findings are captured, analysed using appropriate methodology and tools and used to answer the central research question and objectives. Figure 5.1 shows the structure of the chapter.

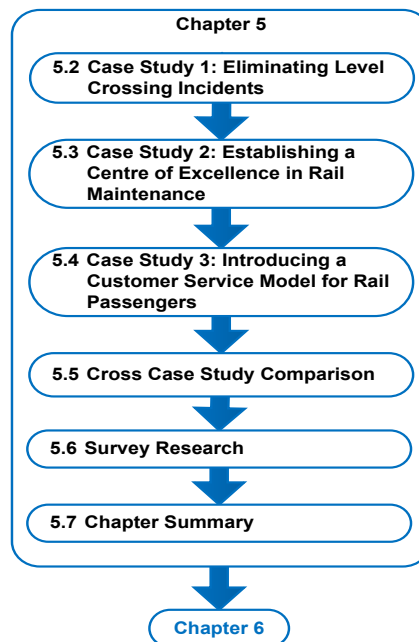


Figure 5.1: Outline of Chapter 5

5.2 Case Study 1: Eliminating Level Crossing Incidents

5.2.1 Introduction

Level crossing incidents are a chronic problem in Australia; people are killed at level crossings due to preventable collisions of rail and road vehicles. This case study provides an understanding of the innovation capabilities which enabled one of the large rail organisations in Queensland, Australia to change embedded management practices and approaches to help resolve this significant issue in Queensland and it can be applied to all level crossings anywhere in the world.

This case study focuses on the management approach instead of the details of level crossing issues and potential solutions. The following section explains the significance of reducing level crossing incidents in Australia.

5.2.2 Level crossing incidents in Australia

Level crossing incidents are a worldwide problem which has persisted over many decades, and continues to pose challenges to management of rail organisations and governments. This is due to the high number of level crossings and the very large cost involved in changing multiple road-rail configurations or constructing many bypass bridges. Australia's rail network is the sixth largest in the world, it has over 44,000 km of track with 23,500 level crossings (TrackSafe 2017).

Level crossing incidents often involve fatalities, major disruption to transport networks, costs and legal battles. In Australia, 601 level crossing incidents have occurred in the past 10 years, including approximately 30 fatal level crossing collisions and over 1,000 near collisions each year in Australia (Nye 2011). People and communities also go through emotional trauma due to level crossing incidents. There

are several awareness programs around the world about level crossing safety. However, despite these programs and other safety measures, many people are still injured or killed every year.

Table 5.1 summarises level crossing incidents recorded in Australia from 1 July 2002 to 30 June 2012, derived from Australian Transport Safety Bureau reports. Incidents in Queensland and Victoria, two states with a large number of rural rail corridors, contributed more than half of the total incidents during this period.

Table 5.1: Level crossing incidents in Australia 2002–2012, by state

Period	NSW	NT	QLD	SA	TAS	VIC	WA	Total
2002 Jul-Dec	7	1	12	6	2	9	0	37
2003 Jan-Jun	3	0	11	4	2	7	2	29
2003 Jul-Dec	9	0	9	7	1	17	1	44
2004 Jan-Jun	5	1	2	6	1	11	1	27
2004 Jul-Dec	8	0	10	5	2	8	1	34
2005 Jan-Jun	4	0	14	3	3	10	2	36
2005 Jul-Dec	3	0	7	5	2	15	4	36
2006 Jan-Jun	7	0	8	3	3	13	1	35
2006 Jul-Dec	2	2	14	7	2	13	3	43
2007 Jan-Jun	6	0	6	3	1	12	3	31
2007 Jul-Dec	4	0	7	3	1	8	2	25
2008 Jan-Jun	2	0	9	4	1	13	2	31
2008 Jul-Dec	4	1	9	1	2	9	2	28
2009 Jan-Jun	4	2	8	1	1	7	3	26
2009 Jul-Dec	4	0	4	3	1	6	4	22
2010 Jan-Jun	4	0	7	1	1	7	1	21
2010 Jul-Dec	4	0	6	1	6	2	6	25
2011 Jan-Jun	6	0	4	0	1	9	2	22
2011 Jul-Dec	5	1	5	2	0	8	6	27
2012 Jan-Jun	4	0	5	1	2	8	2	22
Totals	95	8	157	66	35	192	48	601

Source: Australian Transport Safety Bureau (2012)

5.2.3 Background of the case study

The subject organisation of this case study is one of the largest rail freight haulage operators in Australia, which specialises in transporting millions of tonnes of coal, iron ore and agricultural products. This Queensland-based operator manages a key freight sector and works across Australia.

Because of a history of level crossing incidents which put reputation, morale and public trust at risk, the organisation faced several management challenges:

- There were too many level crossings to manage effectively.
- The organisation wanted to eliminate level crossing incidents.
- Cost effective solutions were needed to reduce incidents.
- The organisation wanted to maintain public reputation and morale among the staff.
- The organisation needed to meet the increasing demands for freight services.

There was a critical need for management to improve level crossing safety. The CEO and senior executives chose to challenge the norms of the organisation, and the traditional approach of 'root cause analysis' and 'continuous improvement' methodologies for resolving significant problems. The organisation's management also decided to take up a new management innovation approach to resolve this significant problem. Management established a taskforce of 22 staff, consisted of executives to frontline staff and a senior executive appointed as the change agent, and an external facilitator to develop a new management methodology. The facilitator ran workshops with a diverse group of organisation staff to collaborate on a solution using novel principles.

This case study explores the management innovation techniques used based on semi-structured interviews, and reviews of relevant reports and presentations. The data

collection, analysis and findings are explained below.

5.2.4 Data collection

Data collection involved semi-structured interviews, and review of relevant documents with associated data. There were 12 face-to-face interviews and one telephone interview conducted using semi-structured interview techniques. The participants in these interviews were senior executives, and senior and middle managers. The organisation provided the list of participants who were involved in the level crossing innovation campaign and who could provide valuable information to ensure that the quality of data for the selected case was adequate.

The aim of the interviews was to understand the management capabilities required to drive, develop and deploy management innovation. All the interviews were recorded and transcribed into NVivo for analysis.

5.2.5 Data analysis

The approach used to analyse the case study data was first to select categories and dimensions, and then look for similarities and differences (Eisenhardt 1989a). In this study, categories are the group of enabling capabilities aligned to the three stages of driving capabilities, development capabilities and diffusion capabilities.

Within these three predetermined stages, several capabilities discussed in the literature review (Chapter 2) and in the proposed research model Management Innovation Capability Framework were used to map the interview comments. Comments were assigned into cells which enabled the researcher to understand, compare and contrast the interview findings, as well as organise the attributes of the capabilities for management innovation.

The main objective of this case study was to explore and understand the management capabilities used through in-depth interviews of a case which enabled the initiation, development and diffusion of management innovation. The findings are discussed in the following section. Representative comments are included, identified by the organisation and interview number, where 'Org1' is from the organisation in case study 1 and 'Int. 1' is interviewee 1.

5.2.6 Driving capabilities

This section explores the interview data on driving capabilities for management innovation. Table 5.2 provides the list of driving capabilities and number of participants who commented on each enabling capability.

Table 5.2: Case study 1 – Driving capabilities

Driving capabilities	Number of participants who commented
1. Sensing opportunities	13/13
2. Sensing threats	13/13
3. Sensing technology needs	4/13
4. Taking risk	7/13
5. Having top management commitment	13/13
6. Having entrepreneurial alertness	12/13
7. Appointing internal change agent	9/13
8. Having vision and desire for major change	10/13

5.2.6.1 Sensing opportunities

Teece (2007b) discusses the importance of sensing and seizing opportunities. All the participants' comments support the need for sensing opportunities through issues especially for new ways and out-of-the-box ideas to solve problems: *“we looked at it through a multifaceted lens, innovation was only one of the attributes that we looked*

at” (Org1: Int1) and “*totally opportunities as well... It is about the vision-purpose workshops through to strategy-setting, through to new business opportunities*” (Org1: Int2). Many researchers have recognised that sensing and seizing is an important capability for management innovation (Benner & Tushman 2003a; Danneels 2008; Jansen et al. 2009; Martin 2011; Miller 2002; Rindova & Kotha 2001a; Taylor & Helfat 2009; Verona & Ravasi 2003).

5.2.6.2 Sensing threats

According to Dottore (2009), sensing threats and sensing opportunities are practised in the organisational environment, and this case study provides evidence to support this claim. Many comments were made about fatalities as business threats: “*we had a truck smash into one of our trains at a level crossing in North Queensland, and that caused the death of the two train drivers*” (Org1: Int2); “*I worked with both of those drivers, one of them I’ve known for thirty plus years and the other one I’ve known for the entire time he’s been in the job*” (Org1: Int4); and “*we had some particularly nasty accidents with level crossings. We’ve consistently had it as a problem in the railways, and it’s identified as a problem nationally and internationally*” (Org1: Int13).

This case study is a good example how a major safety issue and associated risk can initiate a management innovation. Each participant commented that the real reason for this initiative was due to fatalities occurring in level crossing incidents and the death of two train drivers, leading to emotional disruption: “*I think prior to the death of our two drivers, from memory, there was a six year old boy that was killed out near Toowoomba. His school bus – it was like his first week of school*” (Org1: Int1); “*within a couple of months we’d had three fatalities in a very small area*” (Org1: Int4); and “*the truck cab made it through, but he was carrying a truckload of pallets, and the train drove straight into the truckload of pallets. It killed our two train drivers*” (Org1: Int1).

Legal and reputational risks were also noted: *“level crossings are a high risk for us. So the inputs into what we do about high risk, they’re about legal compliance with the rail safety act”* (Org1: Int10). Management sensed the legal threats may lead to business reputation, and therefore the need for management change and opportunity was recognised.

5.2.6.3 Sensing technology needs

Many organisational theories support the need for sensing technology for innovation. Entrepreneurship theory describes the need to sense technology (Aldrich & Martinez 2001). Sensing technology need is also described from an institutional leadership perspective (Benedetto, DeSarbo & Song 2008). From the dynamic capability perspective, various researchers suggest that there is a need for sensing ability to change technology through innovation (Razavi & Attarnezhad 2013). However, only four out of 13 participants’ comments from this case supported the theory that sensing technology can drive the need for management innovation.

The comments made in this case study were about the need to embrace technology: *“We have got technology we just don’t seem to use it. Look at the things we can do on planes, and millions of other industries have embraced change and improvement, we sort of in the rail and transport type industry seem to say ‘oh no, we’ve got adequate”* (Org1: Int4).

Another participant commented: *“I absolutely know your company [the researcher’s organisation in NSW] wouldn’t have taken the approach that it does to developing new technologies”* (Org1: Int5). These comments indicate that the rail industry is lagging behind the technology. Not many participants commented on the technology as the key driver for innovation which may be because this case study is safety-related and the comments were focused on safety-related issues rather than use of technology for

innovation, growth and performance.

5.2.6.4 Taking risk

Comments from the case study supported taking risk for innovation: “I think having the leadership to actually run through and take a risk with this approach” (Org1: Int7); “my view of it is that the risk is that when you bring these new ideas into the business” (Org1: Int6); “I think having the leadership to actually run through and take a risk with this approach” (Org1: Int7); and “because those traditional thinkers bring with them constraints. They have their own thoughts about solutions, generally risk averse... part of our incubation process was how to bring them up to speed” (Org1: Int12). Entrepreneurs understand that failures and setback are acceptable for innovation and they take risk Alez-Benito et al. (2015).

5.2.6.5 Top management commitment

Having top management commitment in place for management innovation is discussed in management innovation, Total Quality Management and leadership theories. For example, management commitment is exhibited in the workplace by enabling financial support, allocation of resources, and employee acceptance (Baer & Frese 2003; Sung, Cho & Choi 2011). Hamel (2006) insists on managers committing to a problem in order to drive management innovation. Total Quality Management researchers insist on the importance of management commitment in terms of involvement, commitment, and support by providing funding and resources (Snee & Hoerl 2005).

Leadership theories also suggest commitment, facilitation of innovation (Bossink 2007), direction and commitment (Bossink 2007; D'Amato & Roome 2009). It is evident from the literature that top management commitment is vital to drive management innovation. Participants in this case study commented on how management support

occurred: *“supported by senior management, funded by senior management, key stakeholders nominated by senior management, so this was very much something that was driven”* (Org1: Int8); *“we were given a pretty open budget for it, and it was quite an expensive exercise”* (Org1: Int6); *“I don’t think it would have anywhere near the degree of success if the chairman and the CEO and also the CFO because of the financial contributions”* (Org1: Int1); *“total support from the boys right up the top, which was greatly appreciated”* (Org1: Int4); and *“it was successful, we managed to follow through the whole process, you know, we didn’t get cut off at any point because of that drive from the CEO”* (Org1: Int6). Management commitment is expressed by the participants in terms of funding, visible management support and being driven from the top.

5.2.6.6 Appointing internal change agent

Executives are responsible for any major initiatives, so they appoint a director or a general manager as their representative to act as the change agent. Birkinshaw, Hamel, et al. (2008) recommend appointing an internal change agent who sets the agenda to resolve a problem which cannot be resolved using existing solutions. Similarly, in dynamic capability theory, the literature also discuss the role of internal change agents who mobilise management innovation by reconfiguring appropriate resources with both internal and external competencies (Teece et al. 1997a).

These concepts were evident in this case study: *“the CEO drove it, he allocated one of his senior executives, to drive it”* (Org1: Int3). The sponsor representative is the change agent in large organisations. These change agents challenge the norms to find solutions to major issues. In the case study, a participant commented: *“sponsor representative, who actually challenged the norm and bought this diverse group together to find this solution”* (Org1: Int1). The change agent in this case confirmed

that *“I had my role as chief innovation officer for about a year when we started this project”* (Org1: Int11).

Mol & Birkinshaw (2006) suggest that the internal change agents look for change catalysts in both internal and external circumstances to make the change possible. This seeking of change catalysts was also evident in this case: *“what the chairman did was he had his advisor, to search the world, then come back and advise the chairman on what we might be able to do to better embed innovation as a recurring part of the DNA of the company in all aspects of what we do”* (Org1: Int1).

From this study, it is evident that driving management innovation requires an internal change agent who can act as a change agent and source external expertise to make the change possible.

5.2.6.7 Entrepreneurial alertness

Many researchers have emphasised that entrepreneurship and innovation are both necessary to focus on an organisation’s people, structure, culture, process and technology and transformation for profit (Avolio et al. 1999). Many comments in this case study were made about entrepreneurial alertness: *“new CEO into the rail industry... he decided that there needed to be an intense focus that would look through a multi-faceted lens, of which innovation would be one of the lenses”* (Org1: Int2); *“the chairman believes that entrepreneurial attributes need to be an inherent set of behaviours”* (Org1: Int2); and *“so it starts off with the imperative, so the CEO of the organisation sets the imperative for the need for this change”* (Org1: Int1). Entrepreneurial behaviour of a manager is portrait by Teece (2007b), that sensing and understanding opportunities, while initiating new ways of putting things together.

5.2.6.8 Vision and desire for a major change

Top management should be looking for a major solution and show passion and set vision and goals to optimise the high value opportunity and set the right environment for change (Battilana 2006; Simon et al. 2003; Ylinenpaa 2009b). Evidence from this case suggests that the CEO and the executive team's desire is important to drive management innovation, they were looking for a radical outcome: *"the CEO of the organisation sets the imperative for the need for this change"* (Org1: Int2); *"I don't think it does happen without some sort of senior executive push"* (Org1 :Int8); *"chairman already had an overarching desire to start, so his outcome was that you would see innovation as part of the DNA of the culture of the company"* (Org1: Int1); and *"CEO personally had backed it and showed personal interest, so came along to the briefings when we were given briefings"* (Org1: Int6).

5.2.7 Developing capabilities

This section explores the interview data on developing capabilities for management innovation. Table 5.3 provides the list of developing capabilities and number of participants who commented on each capability.

Table 5.3: Case study 1 – Developing capabilities

Developing capabilities	Number of participants who commented
1. Process for management innovation	13/13
2. Taskforce for management innovation	13/13
3. Facilitation	12/13
4. Roles and responsibilities	11/13
5. Generating ideas	13/13
6. Stakeholder collaboration	13/13
7. Shaping ideas to solution	8/13

5.2.7.1 Process for management innovation

Mol & Birkinshaw (2006) and Hamel (2006) suggest that management innovation requires a systemic approach encompassing processes. Similarly Parsons (1991) claims that innovation requires a formal program and process and Hamel (2008) added that management innovation is based on a novel idea. Therefore management innovation requires a process to develop the novel idea to a potential solution.

Comments from participants in this case study reinforce the need for a process, however the process discussed was limited to invent the solution, not the end-to-end process of management innovation: *“we used the innovation process, so the imperative, your immersion, insight, innovation, process was for this particular activity... also added incubation and implementation”* (Org1: Int2); *“it was a very specific process, which sounds counter-intuitive, because you want to be innovative”* (Org1: Int8); *“they did bring in the consultant. They had developed a new process with the external consultant for the level crossing campaign”* (Org1: Int7); and *“the first task you’ll do will be a trial on level crossings... to test whether he had picked up the right innovation methodology and framework to achieve the overarching task”* (Org1: Int1).

The comments in this study were based on the process used to invent a solution for the level crossing incidents in this case. This research reveals the end-to-end process, and the framework used for management innovation in large organisations.

5.2.7.2 Taskforce for management innovation

Dynamic capability theory suggests that the reconfiguration of resources is necessary from a resource-based view. According to Teece et al. (1997a) firms must reconfigure resources to respond to organisational needs. This concept is also supported by many researchers and indicates that dynamic capability involves an organisation’s rotation of resources for strategic needs (Eisenhardt & Martin 2000a; Teece & Pisano 1994). Daft

(1978) also pointed out that dynamic capability is the aligning of both internal and external resources to add value to the organisation. This was evident in this case where the organisation used internal and external resources for a short period to create value that was a strategic need for the organisation.

About 22 staff were selected as a taskforce to participate in the level crossing harm reduction campaign. This team was a cross-functional team, and combined different levels of organisational hierarchy from a senior executive to administration staff. It also included track workers from different age groups and ethnic backgrounds. This initiative was deliberately set for a breakthrough innovation by eliminating group thinking and achieving a new idea for the level crossing issue: *“if you don’t have the diversity, you end up with group think. When we used to have the engineering group, so in other words, as we identified something as not a breakthrough innovation, just an evolutionary innovation”* (Org1: Int1). Diversity of working group is made up of gender, age, ethnic background, various professional background to avoid the group thinking.

Other comments included: “there were, twenty, twenty-four people who came from a very diverse background” (Org1: Int2); “they had people from all parts of the organisation and from all levels of management as well” (Org1: Int3); and “there are a lot of resources out there that we never tap into, both in and outside of our organisation” (Org1: Int4). Therefore it was evident that a taskforce needed to be established with diversity including internal and external resources.

Some of the participants commented on the way that the taskforce was prepared and worked offsite: “hey, we are working off-site, which is something that’s probably new, for that extended period of time, you know, five days a week, that was a very different approach” (Org1: Int5); “a lot of the internal resources were handpicked based on partial expertise in the area and partial naiveté. You’ve got people that can stir the

thinking of the experts that have always thought the same way” (Org1: Int6); and “the methodology that we used puts an onus on diversity. So we involved employees from throughout the company, we involved white collar and blue collar, male and female, people that had been here for fifty years, people that had been here for five minutes, and also, stakeholders from outside” (Org1: Int11).

The preparation for the taskforce included preparing people to think differently: “these innovation campaigns drive a change in people. It teaches them a different way to think, it makes them think their opinion is valid” (Org1: Int12); and “the taskforce was made up of the three ‘E’s, Education, Enforcement and Engineering” (Org1: Int2). Establishing a taskforce is an important capability. It is also important to ensure the diversity of the taskforce and preparing for the task ahead is vital for inventing breakthrough ideas along with the methodology.

5.2.7.3 Facilitation

Many leadership theories suggest that facilitation is one of the roles of a leader for innovation (Friedrich et al. 2009; Nonaka & Kenney 1991b), and also indicate that transformational leadership theory transforms the organisation by motivation, inspiration and facilitation Fleishman, Mumford, Zaccaro, Levin, Arthur L. Korotkin, et al. (1991).

According to Birkinshaw, Hamel, et al. (2008), for management innovation, an internal change agent is needed to facilitate and to realise a conceptual idea and transform it into a practical application. In this case study a senior executive was appointed as the change agent and a facilitator recruited from overseas to facilitate management innovation also acted as a change agent: “*so facilitators, very big on climate, very big on focusing on the future, feasibility free initially, and stuff like that*” (Org1: Int12); “*they did bring in the consultant, they had developed a new process with the external*

consultant for the level crossing campaign” (Org1: Int7); “a group out of Boston called [Name]; they’re very well-known in innovation circles” (Org1: Int11); and “so that team was basically there with some consultants on board to help lead the change” (Org1: Int7). It was also stated that “what is very clear from a facilitation point of view, to get the best results for anything, you should always have a separate between process and content” (Org1: Int2).

External capability which includes innovation facilitation expertise appears to be important. This includes managing the process for innovation and helping to conceptualise the outcome of the invention process.

5.2.7.4 Roles and responsibilities

Within leadership theory, instrumental leadership style suggests the importance of defining goals, roles and responsibilities (Nadler & Tushman 1990). However, in terms of roles and responsibilities, the management innovation in this case evolved with finding a solution to the level crossing incidents. Therefore, the roles and responsibilities were not clearly established from the start and only a few roles were clear during the invention process. These included identifying someone who owns the problem and someone who delivers the solution. This approach helped the decision-making, and the taskforce role was to develop new knowledge as well as identify inventors for the problem.

Comments included: “somebody who actually owns the problem, somebody who’s actually responsible for the delivery of the solution” (Org1: Int2); and “the people who ran this particular campaign, managed the process that was being utilised” (Org1: Int5). Apart from this, the role of internal and external change agents is to facilitate the

whole management innovation process, as discussed previously.

5.2.7.5 Generating ideas

Idea generation is discussed widely in creativity theory and knowledge management theory. According to De Vries, Bekkers & Tummers (2015), creativity is closely associated with the idea generation phase of innovation. Tervonen & Haapasalo (2015) pointed out that creativity, ideas and innovation play an important role in developing organisational performance.

Knowledge management theory also extensively discusses the knowledge creation process through tacit and explicit knowledge. According to Nonaka (1994), the dynamic theory of knowledge creation contributes to tacit knowledge and knowledge conversion. Similarly, Argot, Civilly & Reagan (2003) state that knowledge creation is the most important outcome of knowledge management. In this case study, idea generation to create a new knowledge to resolve a particular organisational issue was demonstrated.

Comments from many participants in this case study noted that the organisation created a significant number of ideas on level crossings: *“from memory there would have been 3,000-4,000 ideas put forward”* (Org1: Int2); *“they literally came up with thousands upon thousands upon thousands of ideas”* (Org1: Int1); and *“talking with people and recording their ideas and ensuring that we had that as input into the idea generation process”* (Org1: Int6).

Participants also commented that they were trained to think outside the box and pushed the boundaries for breakthrough novel ideas: *“that idea identification included techniques to help people think outside of their comfort zone, and their filters”* (Org1: Int8); *“it was just getting to open your mind that you know, that nothing was wrong*

[...] and that's why we come up with such great ideas, because there was no restriction on your thinking" (Org1: Int4); "it was an interesting thing to do say, if you give them three options and one of them is a breakthrough" (Org1: Int7); and "it was interesting because it seemed like such a novel approach at the time" (Org1: Int5).

These comments support the theory that idea generation is one of the capabilities required for management innovation. Some of the attributes supporting the idea generation include taking a novel approach, making breakthroughs in ideas, and preparing participants to think outside the box.

5.2.7.6 Stakeholder collaboration

Stakeholder collaboration is widely discussed in dynamic capability theory. Ayuso et al. (2006a) insist on stakeholder dialogue and stakeholder knowledge. Agarwal & Selen (2009) also claim that organisations create new service offerings and service innovation which are the result of collaborative arrangements. Furthermore, Weeks (2009), from the sourcing perspective of innovation, states that dynamic capability enables firms to develop resources from internal and external stakeholder collaboration.

The literature also supports collaborative arrangements being an enabler to create new knowledge, new services and new products. In the level crossing campaign, the organisation needed to create a new innovative idea to resolve the significant problem of incidents which affected a wide range of both internal and external stakeholders.

Comments from the case study confirm that a wide range of stakeholders were involved in the project: "we're talking about the engagement of people outside of the company, is that we deliberately then hooked up with what we call the largest motor

vehicle road club in Queensland, which is our RACQ, in NSW I think it's the NRMA, right, and we also hooked up with each of the local city councils. So the local government authorities" (Org1: Int1).

Participants also commented on several other stakeholders: "you've got the stakeholders, where there was actually the trucking association, the unions, the community, truck stops, police, through enforcement, the government, through financing forty-two level crossings" (Org1: Int2); and "there was a pyrotechnics bloke from down at Warner Brothers down at the Gold Coast, there was also another bloke from an airline, you know the bloke who pilots all the planes in, a flight control attendant" (Org1: Int4).

In the case study, there were comments that the structure of the collaborative meetings was beneficial: "They have monthly meetings, with internal meetings – there's a three-monthly meeting..., on level crossings – and there's a three-monthly meeting with the government department, TMR [Transport and Main Roads], on level crossings" (Org1: Int3).

Both internal and external stakeholders need to be identified and involved from the beginning to contribute ideas and make decisions which will create awareness and ownership of the decision.

5.2.7.7 *Shaping ideas to solution*

Klein & Garcia (2014) studied the idea of filtering methods for open innovations. Many organisations have used crowd sourced wisdom to generate ideas and filter them. The small selection of the best ideas generated has then been considered by the decision-makers in organisations.

Many comments from this case study were insistent on the importance and difficulty of idea filtering, especially when thousands of ideas are collected for one issue: “providing the ideas wasn’t the issue, it was actually selecting them and then actioning from there” (Org1: Int2); and “using very deliberate criteria, which ones we will park, as opposed to which ones will we proceed forward with” (Org1: Int1). The organisation was very particular in selecting ideas that were ‘outside the box’ and a particular methodology was used to select the ideas. One participant (Org1: Int6) detailed the filtering and selection method for the level crossing campaign:

“We were after genuine ‘out-of-the-box’ solutions here, the methodology that we use says that when you get to choosing which ideas to work on, you’ve got three criteria:

Personal intrigue: *Does the idea hit you in the gut and say: Wow! I’d really like to know more about that*

Newness: *Have I ever heard of this before?*

Feasibility: *but it’s the flick of feasibility... if you choose the things that you have no idea how to do... the ideas that are not feasible are the ideas that go forward.*

You can say ‘that’s not feasible’, but we’re going to work on it. And I know that I’m in innovation then... what you do with the rest of the process is you build feasibility into the new idea).”

The literature and this case study show a clearly defined methodology is required to filter ideas because the task to categorise and prioritise a large number of ideas requires a large amount of resources and can impact the quality of decision-making.

5.2.8 Diffusing capabilities

This section explores the interview data on diffusing capabilities for management innovation and discusses these findings by exploring the outcomes of management innovation rather than the outcome of the solution which the management initiated. The scope of this research was to understand the capabilities of management innovation, rather than describe the solution and implementation for level crossing incidents. Table 5.4 provides the list of diffusing capabilities and number of participants who commented on each capability.

Table 5.4: Case study 1 – Diffusing capabilities

Diffusing capabilities	Number of participants who commented
1. Organisational climate	13/13
2. Top management communication	10/13
3. Staff motivation	13/13
4. Staff engagement	5/13
5. Union engagement	4/13
6. Management innovation outcome	13/13
7. Management innovation program and governance	3/13

5.2.8.1 Organisational climate

Organisational climate is considered one of the most important capabilities to diffuse management innovation. Panuwatwanich, Stewart & Mohamed (2008a) studied the role of climate for innovation. They also identified that leadership, a sound team climate, and organisational culture are needed in a combined capability for innovation to take place within an organisation. Also, according to Martins & Martins (2002), an organisational culture model has promoted creativity and management innovation within many organisations.

Many researchers have also supported the importance of organisational culture and transformational climate as an important capability to introduce change, adapt to new situations, and influence management innovation (Birkinshaw, Hamal, et al. 2008; Hamel & Breen 2007a; Hsieh 2011; Rindova & Kotha 2001a; Sheih & Wang 2010).

Evidence from the case study suggests that a degree of emotional energy that could create an environment to introduce management innovation is required: *“the level crossing...[incident] harness the emotional energy within the company, because of the deaths of those people, and take a massive leap forward whereby he was introducing a methodology”* (Org1: Int1).

The emotional energy created the climate: *“we need to make level crossing accidents impossible. So that was a great way to galvanise the team, and the process that we used creates a wonderful climate”* (Org1: Int2). This also shows that management had also driven participants to work towards a common goal: *“we had a really fantastic atmosphere in this campaign, it was like everyone was on the same wavelength, and everyone had a common goal”* (Org1: Int11).

The evidence from this case study indicates that the change environment can be created or influenced by using emotional energy, creating the atmosphere, and driving towards the common goals.

5.2.8.2 Top management communication

Entrepreneurship theory suggests that the importance and relevance of communications to exploit opportunities for innovation (Gregory et al. 2010). According to Pfeffermann & Hülsmann (2011), cross-functional dynamic capabilities transmit information between an enterprise and its stakeholders by using

communication for innovation.

According to Ackermann (2013), communication plays an important role in innovation in many organisations. Communication creates the awareness for innovation when discussing matters relevant to internal stakeholders. External communication creates trust between individuals, industries and institutions.

There are several examples from this case study where communication happened with all stakeholders involved in the project, including frontline staff communicating to the frontline teams: *“the other thing too is that we did a road show, I had two former train drivers, who actually travelled around and had forums in different train depots, talking to the train drivers and saying ‘here’s some beginning ideas, what do you guys think about it’”* (Org1: Int2).

Various mechanisms were also used for communications: *“DVDs, newsletters, your internet, toolbox talks. We got it out pretty well to our staff; it’s not just the general public. Like we were going to have massive big billboards”* (Org1: Int4); and *“through the internal newsletters, for example, but also in information road shows for the frontline staff”* (Org1: Int2). Communications were facilitated by a communication specialist: *“It feels like there was communication and groups working on this, and representation everywhere”* (Org1: Int5).

5.2.8.3 Staff motivation

Birkinshaw et al. (2008) claim that management innovation happens in four steps: motivation, invention, implementation, and theorising and labelling. In the literature, motivation is seen as the major first step to implement management innovation. Leadership literature insists on the importance of motivation. One factor is having

particularly charismatic leadership motivate staff (Bossink 2007; Nadler & Tushman 1990), while another factor is transformational leadership with inspirational motivation (Fleishman, Mumford, Zaccaro, Levin, Arthur L. Korotkin, et al. 1991; Rowold & Heinitz 2007).

Comments from this case study explain how staff were motivated: “They were motivated through several mechanisms, they felt that as a company, that the CEO and the Chairman believed that their input and their participation were critical” (Org1: Int1); “I think that first and foremost we never want to have two of our train drivers die ever again; it was a pretty big motivation” (Org1: Int5); “We had [internal change agent] as a leader there, you wouldn’t get a more motivated, passionate, enthusiastic, guy. He’s just out of his tree all the time, he’s just so passionate” (Org1: Int4); “to have strong leadership to keep the motivation of the group pushing through, that’s been very important” (Org1: Int7); and “it was not about money, it was about people’s lives and respect for people, and everyone had a passion and a common interest, so I think that was the motivation” (Org1: Int11).

These comments show that motivation came from various mechanisms within the organisation, including the change agent’s leadership, and senior executives acknowledging the importance of participants’ inputs. Organisational staff were motivated by the challenge given to them and the emotional connection, in this case the death of the train drivers, and the challenge to eliminate level crossing incidents.

5.2.8.4 Staff engagement

According to Christensen (2010), organisations can achieve breakthroughs in innovation by introducing the four pillars of enforcement, engineering, education and innovation.

In this case study, the organisation established the EDGE program – an acronym for Education, Development, Generation and Execution. The organisation believes that a significant change is possible by engaging and developing staff to generate and execute innovative solutions to big problems. This can be considered a new management approach for resolving big problems, using novel principles, in large rail organisations.

At the time of the case study, the organisation was at the beginning stage of diffusion (as defined by the management innovation methodology), however the EDGE program was established for engaging staff for management innovation. Comments like *“the taskforce was made up of the three E’s, Education, Enforcement and Engineering”* (Org1: Int2) confirmed that this was the approach adopted for management innovation. Comments were also made about engaging staff with influence: *“you have, as participants; you have key influencers, so people who are going to champion the solutions out in the marketplace”* (Org1: Int2). The organisation is also clear that engaging staff with various skill sets will benefit the uptake of management innovation: *“It wasn’t just theoretical experts or engineers involved; it was people from train drivers to admin officers and all that sort of thing, so that was a different approach”* (Org1: Int3). Staff engagement should be based on a principle that works for the organisation, with staff with influence, and non-subject matter experts included along with subject matter experts.

5.2.8.5 Union engagement

According to Meyer & Maltin (2010), union commitment and employee wellbeing have a strong link to each other, and help to create a mindset which impacts the implementation of management innovation.

When management innovation benefits employee wellbeing, the union will support its implementation. Many sources in the literature note the importance of employee relations. Tansel & Gazioğlu (2014) studied the relationships between management, employees, firm size and job satisfaction; and predicted that employees are less satisfied in large organisations when compared to small firms.

Comments from this case study confirm the engagement of unions: “we had representatives, and those representatives were nominated by their unions to be the representatives” (Org1: Int1); “a lot of the time we get, you know, ‘have you consulted the unions’... and the IR issues that come with it, they were involved right from the start, and I think that was one of the biggest benefits” (Org1: Int7); and “we had trade union delegates who were part of the campaign, so you actually had senior managers and trade union delegates all working together on the same thing, committed passionately to the outcome” (Org1: Int11).

Large organisations are complex and have deep hierarchies, which require union consultation for every initiative that impacts employees. In this case, the management initiative commenced with the objective of eliminating level crossing incidents. This has a direct impact on train drivers which motivated the union to become interested and committed to be part of this initiative, and thus support implementation. The union representatives were part of the level crossing campaign from the beginning.

5.2.8.6 Management innovation outcome

According to Mol & Birkinshaw (2006), management innovation is the implementation of new practices in management, and performing activities in innovative ways. This happens while dramatically changing as well as enhancing management functions

effectively, with a departure from current norms.

The success of the level crossing campaign led the organisation to undertake another major project: 'Track Safety'. Many comments confirmed the demand to diffuse this management innovation approach for other organisational issues: *"this massive bursting of a dam, where a whole heap of the executive leaders were turning up saying 'But I want to now do that with track safety', 'I now want to do this with motor vehicle safety', 'I now want to do this with rollingstock maintenance', and the list just went on and on and on"* (Org1: Int1). Other comments included: *"there's probably another twenty or thirty innovations that we really had to come up with the top six or eight"* (Org1: Int4); and *"what the level crossing innovation process did, once people saw the possibility, they went 'Ah, we know now how to stop global warming, we now know how to stop this' – I'm using a metaphor – so let's change the world overnight. That was the impact that it had"* (Org1: Int1).

These comments suggest that there is not only demand for management innovation but also that the management innovation approach has improved by using a change environment while upskilling staff for management innovation: *"I think on the people side of things it's probably the biggest change or achievement we've seen, in terms of embedding a new type of skill and capability in certain people in the organisation"* (Org1: Int5); and *"it definitely created improvement, in regards to how people worked together and so on"* (Org1: Int1). Management innovation creates an environment for change, provides skills for staff to innovate, and creates confidence to take up big challenges.

5.2.8.7 Project management and governance

Many comments from the case study insisted on governance, risk management and business-as-usual programs such as project management becoming embedded in the

organisation: *“I believe, were vital to actually make sure that the intention translated into meaningful action with the normal types of governance and monitoring systems”* (Org1: Int1). Participants also commented on a more flexible risk management approach: *“what we did in the back end was develop a new, more flexible, more creative project management approach”* (Org1: Int7). Risk management can be considered as part of governance. However to implement the management innovation outcome, project management was seen as an important tool: *“apart from the project management side of things, probably not that I can really think of [any other mechanism]”* (Org1: Int3); and *“we dropped back to more of a conventional project management type thing, where you had funding for particular initiatives, and that was more of a business-as-usual approach then”* (Org1: Int8).

Diffusing management innovation into the organisation requires a business-as-usual process with flexibility built into it. This process should include project management, business case, funding and governance including managing risks.

5.2.9 Conclusion of case study 1

The solution for level crossing incidents had not been implemented at the time of the case study. However, there were 11 viable concepts filtered from over 3,000 ideas, and incorporated in the conceptual designs for solutions. It is obvious that this case has adopted generating novel ideas to solve major problems, similar to Hamel (2009)’s recommendation to commit to a major problem to implement a management innovation.

In this case study, management innovation changed how a major issue of level crossing incidents is approached. Every rail incident is investigated by the rail regulators and subject matter experts, and they thoroughly investigate through objective evidence.

This investigation also includes interviewing people involved in the incidents and associated processes, before the regulator recommends a series of improvements to the organisation. These improvements may include changes to engineering and infrastructure, but may also include people-related recommendations such as training, awareness, competency, and train operating and rail network rules.

In this case study, the process of resolving level crossing incidents was explicit but the management innovation process behind this initiative was difficult to identify. This is because the management innovation practice is often overlooked (Mol & Birkinshaw 2006).

The important driving capability was when the sense of urgency due to a big problem emerged. This occurred through the application of a novel principle which used an internal change agent to transform the novel thinking into a practical methodology. This also required other factors to be put in place such as providing adequate support, funding, and applying resources via a taskforce structure. These initiatives changed the organisational climate, educated and upskilled staff, and created commitment. There was a demand for management innovation to not only solve the problem, but for the management innovation process to be able to be diffused to other challenges facing the organisation.

The capabilities discovered in this case study are summarised in Table 5.5.

Table 5.5: Capabilities discovered from the eliminating level crossing incidents case study

Management innovation stages	Enabling capabilities
Driving capabilities	<ul style="list-style-type: none"> Sensing opportunities Sensing threats Sensing technology needs Taking risk Top management commitment Entrepreneurial alertness Appointing internal change agent Vision and strategy Desire for major change
Developing capabilities	<ul style="list-style-type: none"> Innovation process Taskforce Facilitation Roles and responsibilities Generating ideas Stakeholder collaboration Shaping ideas to solution
Diffusing capabilities	<ul style="list-style-type: none"> Organisational climate Top management communication Motivation Staff engagement Union engagement Management innovation outcome Program and governance

5.3 Case Study 2: Establishing a Centre of Excellence in Rail Maintenance

5.3.1 Overview

Passenger railway networks provide vital public transport services, and consequently have both high customer demands and high reliability and safety needs. The rail maintenance industry is complex, and requires special skills to manage a network of large assets and rollingstock with complex technology. Factors which add to complexity are the entrenched traditional practices and a complex bureaucratic organisational structure driven by external factors such as industrial and political influence.

Rail services including rail asset maintenance and operations are complex and require special skills to maintain assets, operations and customer services. To perform these complex tasks requires a solid asset base and well-established policies, systems and procedures to improve services and safety. However, as claimed by Galea (2017), Australian rail industry is currently experiencing shortages of skills in a number of occupations which are critical to rail operations. If there are no effective strategies in place to address these issues, the safety and reliability of the rail network is likely to deteriorate over time. In addition, the industry also faces environmental and economic challenges.

According to the Victorian Government (2009), a Centre of Excellence method has been introduced to railway organisations in order to introduce innovative steps and to manage their innovations. The Centre of Excellence (CoE) generally consists of a cross-functional or a functional team, which manages operations across the entire business, in order to incorporate new practices and knowledge into the existing management

structures. (Frost, Birkinshaw & Ensign 2002, p. 1000) define a Centre of Excellence as: ‘an organisational unit that embodies a set of capabilities that has been explicitly recognised by the firm as an important source of value creation, with the intention that these capabilities be leveraged by and/or disseminated to other parts of the firm’.

In general, the Centre of Excellence helps to develop and embed an operational plan of events and curriculum into the day-to-day functions of the business, offering end-to-end services and rapid efficiencies across major functions of the business.

5.3.2 Background of the case study

For the purposes of this case study, the rail industry Centre of Excellence is considered to be responsible for satisfying all operational and regulatory requirements including:

- promoting and coordinating the activities of the rail industry
- providing technical advice and support on rail technologies and measures
- collecting and distributing information about rail technologies and measures while providing training to rail staff.

The Centre of Excellence is also typically responsible for reviewing and developing improved specifications of rail technologies, technology installations, operations, testing of new equipment and general maintenance. As such, the rail industry Centre of Excellence may be described as a department that carries out its own routine work using best or industry leading practice; and the Centre of Excellence also has an extra role in developing internal knowledge and expertise which is used by the Centre of Excellence to support other centres of activity throughout the organisation.

For example, the Centre of Excellence can support existing training institutes to upgrade and strengthen their capacity for offering training; and conducting tests on rail assets and rail-related technology. In effect, the Centre of Excellence offers the rail

network a suite of industrialised delivery capabilities and business services which help to improve operational efficiency.

The Centre of Excellence also assists in finding out the basic business requirements of railway infrastructure and rollingstock and designing strategies and programs for upgrades and maintenance. The dedicated technological training facility offered by a Centre of Excellence is considered a significant part of the economy and growth within the business, and can, provide a more integrated and better approach to training and education.

The aims and objectives of implementing a CoE are to increase innovation capabilities in the industry; develop highly-skilled and centralised staff training with the latest technologies; and conduct research and development along with continuous professional development. To achieve these improvements within the rail industry, a clear framework for developing a new CoE within a business, and implementing it successfully is required.

This case study investigates the establishment of a Centre of Excellence for a new passenger fleet maintenance centre (depot) in one of the major rail operators in Australia through interviews with selected management. This case study is different from the first case study as the solution is fully implemented.

The 12 people interviewed for this case study included the general manager responsible for establishing the CoE, the depot manager and the CoE manager, along with several depot management staff. The interviewees provided a high degree of insight about what capabilities are critical to enable initiation, development and diffusion of a CoE specific to rail maintenance. The information gathered helps provide an understanding of the capabilities required to build management innovation in large

rail organisations.

In this case, 60 new staff were hired for the CoE and were given the opportunity to work in fresh cultures with fresh ideas in establishing the CoE in a brand new \$200 million rollingstock maintenance facility. This new development required a high degree of planning, methodology development, and ideas generation, which makes it an ideal case study. This case study not only focuses on the details of implementing the CoE, but also discusses the key enablers required to build management innovation capability in large rail organisations.

5.3.3 Driving capabilities

This section explores the interview data on driving capabilities for management innovation. Table 5.6 provides the list of driving capabilities and number of participants who commented on each capability.

Table 5.6: Case study 2 – Driving capabilities

Driving capabilities	Number of participants who commented
1. Sensing opportunities	12/12
2. Sensing threats	5/12
3. Sensing technology needs	5/12
4. Top management commitment	9/12
5. Entrepreneurial alertness	3/12
6. Appointing internal change agent	4/12
7. Vision and strategy	8/12

5.3.3.1 Sensing opportunities

Harreld, O'Reilly & Tushman (2006) emphasise the need for sensing the available capabilities which provide organisations with the capability to make unbiased and

quality investment decisions even under circumstances of high uncertainty. Sensing opportunities is a significant driving capability needed in order to build management innovation capability in large organisations.

The participants stated that building a new depot has probably been one of the biggest initiatives that has occurred in the organisation. Their comments also indicated that sensing new opportunities and using them efficiently is significant in building management innovation capability. Other comments on new opportunities, fresh culture and new ideas were also provided by the managers to support this driving capability.

Respondent managers said: “newly built depot to meet capacity requirements; we thought we would take the opportunity to set a new standard for maintenance” (I Org2: Int1); and “this is the flagship depot, and you need a dedicated team to make this the most effective depot that we operate, based on what we do here, we roll that out to the older depots” (Org2: Int9).

The cultural change opportunity was shown in comments such as: “It was just an opportunity, basically, to put some fresh blood in, fresh ideas, fresh cultures right from the very start of a new depot opening its doors” (Org2: Int1); and “It was definitely an opportunity where you had to hire 60 new people from all, you know none of them were ex railway people, they were all from outside industry, from all different areas, you know, and I think that’s where they’ve taken advantage” (Org2: Int12).

5.3.3.2 Sensing threats

Only five of the 12 participants in the case study supported the theory that sensing threats could drive management innovation. The primary focus of threat-based comments was the fear of losing contracts and business: “*the business comes up for*

refranchise in a couple of years and there might be other parties externally that might be interested in going for the franchise” (Org2: Int3); and “guess the threat of remaining status quo as they say and not, if you stand still for too long you rot, as the saying goes, so you need to be always looking ahead and improve your technology and everything and I guess your processes” (Org2: Int7). Refranchising was also a concern: “the ultimate threat is, come refranchise, if you’ve not shown where you can add value, there’s a good probability that you won’t win the next franchise” (Org2: Int11).

5.3.3.3 Sensing technology needs

According to Benedetto, S.DeSarbo & Song (2008), technology innovation can make for radical product innovation. Technology innovation also tends to get top management recognition and get active support from top management (Sung et al. 2011). Furthermore, Schreyögg & Kliesch-Eberl (2007) claimed that management innovation is the main antecedent of dynamic capabilities in terms of seizing and sensing growing technological capabilities.

This theory was supported by the comments in this case study: “the CoE also gives the best in class usage of technology that’s out there today” (Org2: Int6); and “If you don’t move with the times then you can’t possibly compete in today’s world. There are countries across the world where everything is automated, everything is robotic and human involvement is very little” (Org2: Int1).

Participants commented on the need to innovate with new technology: “use of innovation and technology so we can get things to, becoming more and more digital, we can get things to fix the trains remotely” (Org2: Int9); and “I come from general motors where you use a lot of electrical tooling and automatic tooling, and I tried to bring some of these ideas into the company” (Org2: Int12).

5.3.3.4 Top management commitment

Several researchers support the theory that top management commitment in terms of providing time, resources and funds is crucial for the success of innovation (Baer & Frese 2003; Benedetto, S.DeSarbo, et al. 2008; Holahan et al. 2004; Sharma & Yetton 2003; Van de Ven 1986).

In the case study, managers also indicated that top management was committed to funding this project and followed a clear strategy: *“It’s quite difficult to get a business to throw out a couple of million dollars with no absolute guaranteed return... we had to spend a million dollars getting it fit-for-purpose”* (Org2:Int1); and *“CoE was driven by the management team at the depot, the rollingstock management team and the business improvement teams with the support of the CEO, the COO, the director of HR”* (Org2: Int11).

Top-down support was seen as critical in execution: *“It’s got to be a top-down approach from management, that they need to invest either within people, equipment, hardware, whatever it needs to be, it needs to come from the top”* (Org2: Int9); and *“Yeah the government was very supportive... the CEO...was very keen for it to occur”* (Org2: Int11).

Another level of top management support involved bringing in experience from outside the company: *“we had a CEO who had done similar things before in other parts of the world... having all that kind of information and knowledge gave us a very significant head start”* (Org2: Int11). These comments confirm how important management commitment is to support management innovation.

5.3.3.5 Entrepreneurial alertness

According to Yu (2001a) entrepreneurial alertness is the activity of endeavouring profit

opportunities, either within the existing situation, or exploring whole new profit opportunities. Entrepreneurs must look for long-term benefits by shaping resources and integrating them into enterprise management systems (Wang et al. 2006).

In this case study, the opportunity for the organisation was the \$200 million construction of a new maintenance depot. The development of modern facilities provided management with the opportunity to employ a new workforce and to build a new work culture. Many comments from the case study not only confirmed the opportunity as being present, but also highlighted how commercially the organisation is committed to return on investment: *“it is a very commercially hard edge, bottom line driven company that’s seen the value, cause they got money off the bottom line”* (Org2: Int1); and *“I’d have said to this company, ‘I need you to pump out 2 million and you might get 15 million back’, it’s a difficult proposition in a public company”* (Org2: Int1).

According to (Teece 2007b), the entrepreneurial behaviour of a successful manager is primarily about sensing and understanding opportunities, and initiating new ways of putting things together. This is supported by the comments that make it evident that new initiatives and innovation were an important part of the requirement to set up the CoE: *“it was identified the need for a team to be able to take forward the initiatives and that was identified I think initially by the GM”* (Org2: Int1); and *“the GM at the time made the decision we were going to make it an innovation centre if you like”* (Org2: Int11).

5.3.3.6 Internal change agent

In this case study, only four of the 12 participants made comments on appointing a sponsor representative. This was because the organisation appointed a CoE manager within the organisational structure and this position was not seen as having other managerial responsibilities. Similar to other management innovation initiatives, there

is evidence from the participant comments the CoE manager was solely responsible for implementing the CoE initiative: *“the CoE manager controlled the trainers, the risk assessors, and the lean [team]”* (Org2: Int1); and *“I think the driver is the manager here, which is myself. So any idea that comes forward or anything that needs to be implemented or changed”* (Org2: Int5).

Recognition of a proven capability in the appointed manager was also important: *“I got a call from the General Manager saying can you come to [the new depot] and try to implement some of the initiatives and get the place up and running”* (Org2: Int11). This was confirmed by the general manager who was responsible for implementing the CoE, and the CoE manager who had the accountability for implementation.

5.3.3.7 Vision and strategy

According to Ross & Gray (1997a) there are four management competencies which are required for leadership capabilities to enable the management innovation change process:

- management of attention through clear vision in the sense of outcome or directions
- management of meaning through communication of vision
- management of trust through reliability and constancy
- management of self through the capacity to know one’s own skill to deploy innovation effectively.

In the case study, comments were made about vision and desire for a major change: *“That was the whole strategy into it, that says, all of the current processes have been the same processes for the last 15 to 20 years, no one has challenged them, no one has changed them, we’re now going to challenge them all, and we’re going to do it”* (Org2: Int1).

Board-level management support was also shown to be effective: “the board may have decided ‘Ok, well we’d like this new depot to be the CoE’ as it was a brand new facility, brand new plant and equipment, new processes, new procedures” (Org2: Int3).

Operational management support was also a second tier of management support which was critical: “CoE was driven by the management team at the depot, the rollingstock management team and the business improvement teams with the support of the CEO” (Org2: Int11); and “it [the new depot] was structured different to all of the other depots in that it had a depot manager and a CoE manager” (Org2: Int1).

5.3.4 Developing capabilities

This section explores the interview data on development capabilities for management innovation. Table 5.7 provides the list of development capabilities and number of participants who commented on each capability.

Table 5.7: Case study 2 – Developing capabilities

Developing capabilities	Number of participants who commented
1. Process for management innovation	12/12
2. Resource configuration	10/12
3. Facilitation	12/12
4. Generating ideas	11/12
5. Stakeholder collaboration	9/12
6. Shaping ideas to solution	4/12

5.3.4.1 Process for management innovation

Implementing innovation requires a sound process. The importance of process for management innovation has been recognised by (Hering & Phillips 2005; Mol & Birkinshaw 2006).

From the case study, it was evident that the organisation had attempted to package

many industry best practices as part of implementing the CoE including:

- building a new location with modern maintenance facilities
- implementing Six Sigma practice
- implementing Balanced Maintenance Practices, a maintenance plan to optimise train availability.

Other good practice included introducing performance management through visual management cells; processes for innovation; and hiring expert practitioners to support innovation.

Comments from the interviews highlighted both the tools and techniques implemented as part of establishing the CoE: *“The basic technique is lean. We looked at every single process on all our major exams and applied lean methodology”* (Org2: Int1); *“visualisation, the visual boards that is a quick snapshot of how the depot or the projects are tracking”* (Org2: Int3); and *“there is a process that we call the innovation process where we look for ideas or suggestions from the shop floor”* (Org2: Int4).

Learning from good practice elsewhere and upskilling staff was an important element of CoE: *“an example of that, myself and a colleague went to Japan and saw the lean manufacturing side of things, so we’re also doing that here, where we’re using the Japanese way of working, the Toyota way”* (Org2: Int6); and *“the training, which is again a separate beast, it’s been identified that we need to look at skilling our people for the future, upskilling our people for the future”* (Org2: Int6).

Comments from the participants also showed that the organisation tried to embed many of these industry common best practices to improve processes. Emulating success in other companies was shown by comments: *“what the philosophy behind the CoE is to ensure that everything we do is world’s best practice in rail I guess”* (Org2: Int6); and *“now, they introduced many different systems and processes so, shadow-*

boards. Shadow-boards is standard in manufacturing, not in maintenance” (Org2: Int10).

Six Sigma techniques, common in manufacturing for many years, were also introduced: “So a process such as 5S [part of Six Sigma methodology] where we have a systematic approach to cleanliness and process orientation, we can develop it here and then use it as the model platform” (Org2: Int9).

Having a sound process can provide a systematic approach, clear business rules to follow, and a repeatable set of instructions for implementation. Once the process and methods become embedded, and repeatable, they can form an ongoing part of a defined program which implements creative solutions for management innovation (Birkinshaw, Hamal, et al. 2008; Feigenbaum & Feigenbaum 2005; Hamel 2006; Mol & Birkinshaw 2006; Parsons 1991).

5.3.4.2 Resource configuration

According to Wang et al. (2006) an organisation must assemble internal resources to execute projects. This is generally seen as critical to delivery. However, Helfat & Peteraf (2003) claim that firms primarily draw on existing internal competencies, or rarely invest in new ones where specialism is required. This supports the idea that resourcing, particularly using existing resources, is not dependent on specialist or niche skills and, assuming the resources are available, that they are fundamentally interchangeable.

In this case study, the organisation assembled internal resources and also employed some external competencies for specialist needs. Many participants commented on the re-use and need for recruiting external competencies: *“we deliberately targeted people from outside of the railway industry with very good mechanical and electrical*

skills... from the aircraft industry and the automotive industry” (Org2: Int1), “That was an initiative put forward by senior management to have a group of people, to look at the way we do our business and improve it” (Org2: Int5); and “so it is a permanent team, but within in-departmental skills. So you’ve got mechanical engineers, electrical engineers... we’ve got trainers in that department as well, which are cross-functional” (Org2: Int6).

This cross-functional or interchangeability of base skills was also shown in management resourcing: “this centre has 7 staff that focus on CoE” (Org2: Int9); and “we had a GM that had come from Europe, and been involved in depots and innovation before; we had ultimately myself, who had been involved in depot maintenance and innovation in Europe” (Org2: Int11).

Many leadership theories in the literature discuss the importance of resources. Specifically, however, dynamic capability theory emphasises the sourcing and configuration of appropriate interchangeable resources for management innovation. (Eisenhardt & Martin 2000b; Jianwen et al. 2009; Teece et al. 1997a; Verona & Ravasi 2003).

5.3.4.3 Facilitation

According to Amabile et al. (1996), management has a need to facilitate innovation by generating and maintaining circumstances which support creativity and idea generation. This can create enabling conditions which entail the provision of opportunities and resources and also have the follow-on effect of reducing constraints or factors that could affect individual creativity. Research shows that facilitation is important for management innovation (Bossink 2007; D’Amato & Roome 2009).

Comments that did highlight the need for facilitation included leveraging outside

expertise: “we recruited a CoE manager from outside” (Org2: Int1); “expert practice team is what we’re called, our team. So again, we look at any processes or procedures, or really anything else that may need changing” (Org2: Int4); and “well I think having that CoE and what it’s done here is to have a team that’s sitting at the side looking in. So they’re not, as I say, involved in the day job” (Org2: Int6).

Putting into place competing ideas required bringing together a diverse group of managers, and getting them to accept these ideas as a group: *“the idea behind the CoE was to enable us to take forward ideas and innovations that were thought of by various managers by having a dedicated support team”* (Org2: Int10); and the support team is *“called expert practices group, so that’s our title, 9 or 8 of us in the group”* (Org2: Int12).

Additional comments supported the idea that where required external facilitation was obtained: “it’s been given to the expert practices group, I’m guessing that’s why. And also to become affiliated with TAFE organisations to help with training of our people” (Org2: Int12); and “we had a facilitator from England” (Org2: Int5).

5.3.4.4 Generating ideas

Knowledge creation and sharing is an important dynamic interplay for management innovation (Howells 1996; Nonaka & Kenney 1991b). Comments by the respondents support the idea that ideas generation is one of the most important capabilities for management innovation. Many of the comments focused on distributing information: *“lot of the initiatives come from the shop floor staff so you need to fund it. So you pick your initiatives – it’s ground floor driven”* (Org2: Int1).

There seemed to be more comments on getting shop floor ideas, than top-down ideas as shown by other comments: “there is a process that we call the innovation process

where we look for ideas or suggestions from the shop floor. The staff who are maintaining the trains know best the processes and procedures and methods” (Org2: Int4); and “we took a lot of ideas off the shop floor and initiated those over the past 12 to 18 months to make the depot run better, for manual handling and for efficiency” (Org2: Int5).

Several ideas seemed to be well known, or existing industry practice, but needed buy in from management: “well, we go back to our Toyota way, with the lean manufacturing and the continuous improvement groups where each team is asked to come up with a new idea, a new initiative every month” (Org2: Int6); “we have people come up with ideas and we have a look at it, and if we can implement those ideas we certainly do” (Org2: Int8); and “people that have passed on ideas and also getting the guys on the shop floor doing their job everyday” (Org2: Int12). However how ideas from shop floor can initiate a management innovation is not known at the time of this study. Comments showed that ownership of the ideas was recognised: “we gave them a board to write their ideas on and asked them to put their initials on it” (Org2: Int11).

The literature has consistently shown the importance of sharing ideas and tacit knowledge, as well as supporting the idea that there is a need to convert the ideas to specific business needs (Amabile et al. 1996; Bergendahl & Magnusson 2015; Cui & Wu 2016; Nonaka 1994).

5.3.4.5 Stakeholder collaboration

According to Tyagi (2008), management innovation also encompasses the areas of strategic innovation and collaborative innovation, which can transform synergies to harness capability and creativity. Similarly, Hamel & Heene (2003) emphasise the

importance of collaboration for management innovation. Comments in this case study insisted on the importance of both internal and external stakeholders' collaboration: *"we took our major stakeholder PTV [Public Transport Victoria] around the facility, explained what, why, what the strategies were, our view of it for the future, bearing in mind at some point it would probably go back to PTV"* (Org2: Int1); and *"I'm quite certain that all the stakeholders would've come together for this"* (Org2: Int7).

Involving a wide range of expertise was shown in comments: "certainly, well I guess all the way through, different stakeholders, and some of the innovation that we've now implemented have got different stakeholders involved as well" (Org2: Int11); "always involving stakeholders to ensure that what you roll out is what they plan to do or would like to happen" (Org2: Int2); and "absolutely engineering, operations, drivers, bringing everyone together" (Org2: Int6).

Stakeholder collaboration is recognised in the literature as one of the key capabilities for the success of innovation, with a focus on including stakeholder collaboration and stakeholder knowledge (Agarwal & Selen 2009; Ayuso et al. 2006a).

5.3.4.6 Shaping ideas to solution

Klein & Garcia (2014) studied the 'idea filtering' method required for open innovations. Many organisations have now turned to crowd wisdom or crowd-sourcing to generate a multitude of ideas and pre-filter them. The small selection of best ideas is then considered by the decision-makers in an organisation. Implementing a system of ranking means asking participants to provide the relative rankings of 'idea pairs' rather than the individual rating of specific ideas (Baez & Convertino 2012). Once ranking has been performed, an additional round of voting is intended to filter or select the best ideas (Zhang & Zhang 2014).

Comments in this case study discussed this topic in the context of idea development and favoured bottom-up rather than top-down approaches: *“any of the ideas that came off the shop floor went through the expert practices team which they helped to implement”* (Org2: Int5); *“and that’s when we come back to the workshop and we start talking to the individual, who then sets up a small committee of... depending on the project as well, the size of the project”* (Org2: Int7); and *“they would then build up the business case with a view to roll, changing the function as we do it currently, and roll it out to the rest of the business so that we ended up with a consistent approach to change”* (Org2: Int10).

Selection of ideas has been a topic for research into evaluation approaches, and several approaches are currently used in industry, such as ‘multiple customer-defined’ approach (Slamka, Jank & Skiera 2012); ‘pre-allocated funding for idea evaluation’, (Bailey & Horvitz 2010), and ‘voting of idea filtering’ (Soukhoroukova, Spann & Skiera 2012). Although supporting evidence in this case is limited, the relevant literature seems to indicate that organisations can be overwhelmed with ideas and struggle to perform evaluation of ideas unless a clearly defined methodology is available.

5.3.5 Diffusing capabilities

This section explores the interview data on diffusion capabilities for management innovation. Table 5.8 provides the list of diffusion capabilities and number of participants who commented on each capability.

Table 5.8: Case study 2 – Diffusing capabilities

Diffusing capabilities	Number of participants who commented
1. Organisational climate	6/12
2. Top management communication	10/12
3. Staff motivation	12/12
4. Staff and union engagement	6/12
5. Management innovation outcome	8/12
6. Management innovation program and governance	4/12

5.3.5.1 Organisational climate

Hamel & Breen (2007b) define management innovation as a total change of institutional culture. Comments from participants in this case study support this line of thinking on the need to create organisational climate for change. High work standard, and modern facility, diversity and a continuous improvement culture seemed to create the culture for innovation: *“you’ve got the highest standards, you can come and change anything here”* (Org2: Int1); and *“I’ve brought in a brand new workforce of 80 people from outside industry to work on specialised equipment, the only people with any expertise was 3 supervisors, 4 supervisors sitting in here”* (Org2: Int5). People continued to be an important dynamic in follow-on comments: *“I think the biggest improvement of the CoE is the people [...] the culture that is generated there”* (Org2: Int5).

Benefits of diversity were also a key focus of the comments: *“whereas possible we’ve been, with the ex-public operated rail industry, there is a tendency not to be so concerned, and that’s why this CoE is able to promote the changes, show the benefits of the changes on a win-win basis”* (Org2: Int10); *“one of the benefits we had here [the new depot] was that [...] we had new staff so we were able to start as we were meant to go on [...] we already had a good culture”* (Org2: Int11); and *“we’ve moved other*

people from different departments to [the new depot] we're going through that changing mindset again as far as making those guys more aware of what we can achieve by providing initiatives and ideas" (Org2: Int11).

Initiating change in larger organisations requires an enormous effort due to bureaucratic formalisation and resistance to improvement.

5.3.5.2 Top management communication

According to Ackermann (2013) communication plays an important role in innovation in many corporate organisations. Pfeffermann, Hülsmann & Scholz-Reiter (2008) state that the communication of innovation is a key component of a firm's cross-functional dynamic capabilities. From participants' comments in the case study, it was evident that communication played a significant role in establishing CoE initiatives.

That communication helped build engagement was shown by comments: "well that was all in the stakeholders' engagement, the fleet magazine, the corporate magazine about a CoE, what it was going to do, why it was going to be there" (Org2: Int1); "at the end of the day it just comes down to communication and keeping the end goal in sight too" (Org2: Int3); and "they'll [managers] normally talk to them [frontline staff]. If it's a small issue they'll do it through a toolbox talk, or if it's a large issue, they'll do it through management forums" (Org2: Int5). Management communication was also discussed in the importance and promotion of achievements: "having the thought to communicate that with the manager doing the other bit, and if there's no communication there then the whole thing falls apart quite quickly" (Org2: Int7); and "[newsletter from management], it's a weekly publication and wherever possible the CoE is promoting what we've done as new initiatives within [newsletter]" (Org2: Int10).

Identifying a communication process early also showed benefits: "I identified that

pretty early on and then we put more, more of a robust communication process in place” (Org2: Int11); and “the whole awareness is based on making sure that you’re having an open dialogue and communication with everybody as frequently as you can” (Org2: Int11).

Communication provides a key symbolic interface between the organisation and its stakeholders. The literature also shows that it has an influence in the success of management innovation and success of the organisation (Hogan & Coote 2014; Keramati & Azadeh 2007).

5.3.5.3 Staff motivation

Sosik (1997) states that through inspirational motivation, transformational leadership involves the relevance of seeing innovative ways for performing actions and encouraging synergies. Amabile et al. (1996) points out that management innovation concentrates on intrinsic motivation, whereas Fleishman, Mumford, Zaccaro, Levin, Arthur L. Korotkin, et al. (1991) suggest that motivational behaviours promote team members by putting forth a continual effort.

Comments from participants in this case study suggest that new staff, new working conditions and new forms of monetary recognition are key tools for motivating staff: *“so as you go up the tree, the bonus motivation to meet your major [Key Performance Indicators] is quite strong, it’s a fair bit of money”* (Org2: Int1); and *“well, the key is enthusiastic people, ready for a challenge, happy to be working in rail with an opportunity to make a difference to the business”* (Org2: Int3).

Money may not always be the driving factor, however: “well they employed people externally so you can’t say there’s any motivation here” (Org2: Int9); “we’ve actually found that money is not always the motivation. Money’s not always the cure either...

staff motivation is ultimately based on the culture that you can develop at the depot” (Org2: Int11).

Recognition from peers seems to play a large part in innovation execution: “it’s about recognition as well, recognition from their peers and sometimes they’ll put people in our weekly inter-company magazine” (Org2: Int12).

The existing body of literature on leadership theories supports the importance of motivation (Avolio et al. 1999; Unsworth, Brown & McGuire 2000).

5.3.5.4 Staff and union engagement

According to McMullan (2013), the engagement of an employee is considered important for the implementation of management innovation. Tansel & Gazîoğlu (2014) studied the relationships of management and employees, and claimed that job satisfaction is the most important factor for employee engagement.

Comments from participants in the case study highlighted the importance of staff engagement for decision-making, keeping the staff informed, insisting on the expected behaviour, and engaging frontline staff: *“the whole thing about innovation is having the ability to make decisions quickly because the longer they loom – the main key here is to keep the guys engaged”* (Org2: Int11); and *“the business has a drive to implement lean practices and lean initiatives and certainly team work and stakeholder engagement, keeping people informed and involved at all steps of the process”* (Org2: Int3).

The idea that communication was required to embed new practices is shown by comments such as: “we were asking people to act and to behave in a way that none of the depots did” (Org2: Int1); and “so basically that’s the way they’ve moved forward and I think it’s purely because of our involvement with our guys downstairs [frontline

staff]" (Org2: Int12). Comments from the participants emphasise the importance of employee and management relationships for management innovation.

Few comments were made about union engagement: "the unions got involved quite early at [the new depot]" (Org2: Int1); and "whenever anything involves shop floor staff we need to have union representation, we need to run things past the union" (Org2: Int4). Union delegates were engaged to review the enterprise bargaining agreement and working conditions and sent to the United Kingdom to see the actual implementation of CoE: "we came to a new facility that was controlled by a [Enterprise Bargaining Agreement] ... for the workers, on how that was put together" (Org2: Int5); "we sent ... union delegates, over to the UK on a fact-finding mission so that it sold the idea to the unions and showed that it was a good idea" (Org2: Int6). Unionisation has also played a mediating role between workers' wellbeing and innovation within an organisation (Bryson, Dale-Olsen & Barth 2009). The common purpose of unions is to take a role for negotiating better working conditions (Antoniolia & Mazzantib 2017). However, whenever a large organisation is making significant changes, the union is involved to review the impact on employees and agree to the changes in working conditions on behalf of employees. Where a management innovation initiative has the potential to make significant changes to organisations, union consultation is important to make the change smoothly. It is not immediately evident from this case study why, if unions have the potential to cause much disruption, they were not more of a topic for discussion in innovation.

5.3.5.5 Management innovation outcome

According to Mol & Birkinshaw (2009), management innovation can introduce new practices to a company which enable it to focus on a larger pool of bigger capabilities. Similarly, Hamel (2006) describes management innovation as changes to business

practices and models, systems and structures for making the organisation more creative and innovative.

Comments from participants in this case study indicate that the organisation went through significant change in order to create a CoE, as well as introducing the concepts to other areas.

Supporting comments show that safety, reliability, and standardisation were all important outcomes or benefits from this project: *“we’re trying to standardise across all depots now, with our ideas [... be]cause all depots do different things different ways”* (Org2: Int3); and *“we’ve improved the actual reliability of the fleet and the availability of the fleet. We’ve also improved the efficiency of the maintenance team”* (Org2: Int6).

Follow-on benefits included providing better service to the public: *“more trains are available on the network during the AM and PM peaks”* (Org2: Int7). Additional benefits included internal process improvement: *“it’s achieved enormous value to the company [...] materials being available for maintenance in all our depots, not just [the new depot], because [...] our stores depot feeds the other warehouses of spare parts”* (Org2: Int8); and *“ultimately best practice has been achieved here and [...] they’re trying to implement that at other depots”* (Org2: Int11).

Standardisation to realise efficiencies was another key benefit put forward in comments: *“this [...] standardised a lot of the work which has obviously helped the bottom line, it’s helped make sure that one quality is there”* (Org2: Int12).

In this case, the outcome of management innovation was a working CoE, and the organisation is in the process of implementing CoE in other depots.

5.3.5.6 Management innovation program and governance

According to Kavanagh & Naughton (2009), project management has a positive relationship with increasing innovations. Similarly, Fagerberg, Verspagen & Mowery (2008) have identified that there is a strong link between project management and innovation.

Comments in this case study were made on how project management enables management innovation, primarily execution-based: *“project status, next step, house tracking [...] things of that nature”* (Org2: Int3); and *“CoE manager does project plans for everything [...] and the project plans clearly show timeframes and responsibilities”* (Org2: Int6).

The literature shows that project management has a strong relationship with executing the outcomes of innovation in terms of initiating, planning, monitoring, implementing and closing. Without management of resources to deliver the concrete form of the idea, there would be no actual outcome (Kareem 2014; Kavanagh & Naughton 2009).

The capabilities identified in this case study are summarised in Table 5.9 below:

Table 5.9: Capabilities discovered from the Centre of Excellence case study

Management innovation stages	Enabling capabilities
Driving capabilities	<ul style="list-style-type: none"> Sensing opportunities Sensing the threats Sensing technology needs Top management commitment Entrepreneurial alertness Appointing change agent Vision and strategy
Developing capabilities	<ul style="list-style-type: none"> Process for management innovation Resource configuration Facilitation Generating ideas Stakeholder collaboration Shaping ideas to solution
Diffusing capabilities	<ul style="list-style-type: none"> Organisational climate Top management communication Staff motivation Staff and union engagement Management innovation outcome Management innovation program and governance

5.4 Case Study 3: Introducing a Customer Service Model for Rail Passengers

5.4.1 Management innovation approach for a new customer service model

According to Birkinshaw, Hamel, et al. (2008), management innovation encompasses the invention and implementation of a management practice, process, structure or technique. An example of applied management innovation is the customer service model introduced by one of the large rail organisations in NSW. This customer service model is currently making significant changes to management practices, resources, processes and associated technology to provide better customer service to rail passengers in the Sydney metropolitan region. The ongoing implementation of this customer service model was selected in order to study how management innovation is developed and diffused in large rail organisations.

Skålén et al. (2012) claim that service innovation is accomplished through either the adaptation of resources to new ways in existing practices, or the application of new resources to modified practices. Both methods could also be applied together. To achieve an innovative service solution for customer service at Sydney Trains, top management took this combined management innovation approach to develop a new service model, which makes it an excellent candidate for a case study.

5.4.2 Customer service in the rail industry: Case study

Customer service is the heart of every business and customers are the primary reason for any business to operate. Organisations must continuously strive to understand customer needs and find ways to improve customer satisfaction by improving business

models, structures and processes to create value for their customers. Without an effective customer service strategy for existing and potential customers, it would be difficult for any organisation to survive. This is because the expectations of customers continue to increase over time, with ever-increasing demands for value-for-money and quality of services. Customer service in the rail industry is not substantially different from any other organisation. According to Accenture (2011), the travel industry, including rail passenger service, is considered one of the industries most susceptible to event-driven market changes or new consumer behaviour. This level of change means that providing effective customer service requires extra time, cost and resources. Exceptional customer service can make a business grow and prosper.

Passenger rail transport is one of the major modes of transport in most industrialised countries, particularly in large metropolitan areas. Today, travellers are demanding better transport systems, through advanced technology to enable travel, and improved customer service. Laube & Mahadevan (2008) argue that the rail industry provides a service to the passengers who are its obvious customers, but still has to embrace the concept of customer orientation into the industry core processes. However, Caimi et al. (2009) claim that the rail industry has just recently begun to view themselves as a service industry, providing services to its customers.

According to Rail Safety and Standards Board, London (2009), the main aspects in enhancing customer service in the rail industry include improving the reliability of service, safety, frequent services, punctuality, quality of journey, cost of tickets, dealing with service disruptions, transport connectivity, signage, cleanliness of trains and the overall satisfaction of customers with their travel.

In Australia, many new rail plans have been proposed to enhance customer service, including metro services and new intercity trains. The industry focus is now on

improving the experience of customers. This means that transport agencies are also focusing on offering their customers clean, efficient and reliable transport services, better information, and more accessibility to customers (Transport for NSW 2013).

The rail industry is shifting towards focusing on customer service areas such as the station environment and improving the technology employed. Safety is also considered another important factor in the rail industry determining the safe service for its customers. The customer service model can be the catalyst for driving the Australian passenger rail industry from being 'train-centric' to being a 'customer-centric' industry.

This case study focuses on how a new customer service model was initiated and developed using a management innovation approach which helped the senior executives to develop a methodology for a new model, and diffuse the management innovation approach for other requirements. This approach also defined the capabilities which helped to make the change possible.

5.4.3 Background of the case study

According to Transport Bureau of NSW (2014), about 310 million passenger journeys occurred in 2013. The NSW government and Transport for NSW have initiated a strategy to improve customer service across the 'transport cluster' including trains, buses and ferries, with the vision of integrated transport to drive better transport outcomes for the community.

In July 2013, the NSW Minister for Transport announced the creation of two new rail operators: Sydney Trains for metropolitan customers, and NSW Trains for long distance (regional) customers to meet their distinct needs (Berejiklian 2013). To achieve the minister's vision, Transport for NSW was made responsible for improving customer experience, planning, program administration, policy, regulation, procuring

transport services, infrastructure and freight. The Customer Experience Division of Transport for NSW is responsible for ensuring the needs, preferences and opinions of transport customers are incorporated in transport planning and drive improvement in customer satisfaction.

In 2012, the Customer Experience Directorate was established as part of a major reform within the organisation to focus on improving customer experience. Since the introduction of the customer service model, customer experience has been assessed twice a year to measure overall customer satisfaction. Results from Transport (2015) shown in Table 5.10 indicate that the organisation is has been improving customer satisfaction since its inception, with an increase of 11% over four years.

Table 5.10 Overall train customer satisfaction in Sydney, 2012–2015

Month and year	Overall customer satisfaction
November 2012	79%
November 2013	83%
November 2014	88%
November 2015	90%

Source: Transport for NSW Customer Service Index (2015)

The customer service model which enabled Sydney Trains to improve its customer satisfaction was built on the principles of customer predictable needs, and aimed to make significant shifts in the quality of service provision by mobilising human resources differently, using technology for better service, and creating a customer-friendly environment to change its focus from train-centric to customer-centric services.

People are used to experiencing high standards of service from the aviation,

telecommunication and information technology industries. They are accustomed to automated, quick, online services and/or friendly face-to-face customer services in a pleasant environment and they expect the same standards with rail services. The aim of the Sydney Trains customer service model is to make a paradigm shift in providing services at a level exceeding the rail industry standard, to a standard that can be benchmarked against other service industries.

To achieve high quality customer service, the organisation has introduced a customer service model, and recruited general managers, executives and senior managers from other service industries to make a significant change. This approach took the focus away from train-centric and operational to customer-centric services. The idea was originated by the Executive Director, Customer Service, and was supported and driven by executives, general managers and senior managers.

Hamel (2006) describes management innovation as changes to business practices and models, systems and structures for making the organisation more creative and innovative. This customer service model is the outcome of management innovation. This case study is a good example of management innovation because it took an innovative approach to a significant problem, and made major changes to the organisational structure, business model and practices. The aim of this research is to study the capabilities which enabled this management innovation; it was not intended to study the process, or the implementation of the outcome and benefits of the outcome.

5.4.4 Data collection and analysis

Data collection for this case study involved 11 face-to-face semi-structured interviews. The aim of the interviews was to understand how management initiated, developed

and implemented a new business model from concept to implementation. It also investigated the key capabilities which enabled the new business model. One of the general managers sponsored this research and provided a list of participants. The participants were involved in the development of the customer service model, and most of the participants were senior executives, general managers and senior managers.

5.4.5 Driving capabilities

This section explores the interview data on driving capabilities for management innovation. Participants commented on sensing opportunity in various forms including sensing opportunities to provide cost effective services, understanding customer needs, level of customer satisfaction, sensing technology needs, and opportunity for business growth and also sensing threats and driving the management innovation forward through vision, strategy and desire. Table 5.11 provides the list of driving capabilities and number of participants who commented on each capability.

Table 5.11: Case study 3 – Driving capabilities

Driving capabilities	Number of participants who commented
1. Sensing the need to improve customer service	11/11
2. Sensing customer expectations	9/11
3. Sensing the need to improve customer satisfaction	10/11
4. Sensing threats	9/11
5. Sensing technology needs	8/11
6. Top management commitment	11/11
7. Business transformation	10/11
8. Vision and strategy	10/11
9. Desire for a major change	9/11
10. Sensing opportunity for cost reduction	10/11
11. Sensing business growth	11/11

5.4.5.1 Sensing the need to improve customer service

Finding significant gaps in service quality can lead to management innovation. According to Lee & Hwan (2005), quality of service is the antecedent of customer satisfaction, and the quality of service impacts customer satisfaction and profit directly. When management realises that an organisation is delivering poor service quality, they strive to make a 'step change' resulting in changing business models and practices. This was acknowledged by the participants in this case study: *"the real drivers are we have to make a steep change in customer service delivery"* (Org3: Int5); *"the driver was we needed to improve and deliver customer service on our stations and you know, on our trains"* (Org3: Int3); *"the driver is actually you know the need to actually serve our customers differently"* (Org3: Int1); and *"what we're trying to do is to recruit people with the inherent customer service capabilities"* (Org3: Int2). Angelova & Zekiri (2011) claimed that delivering high quality is the key to sustaining competitiveness. Delivering quality service is important for competitiveness and improving customer satisfaction.

From these comments, it was evident that managers are looking for opportunities to provide quality services. This may be by effectively using resources, using technology or innovation to improve the quality of service, and therefore sensing quality of customer service could drive the need for management innovation.

5.4.5.2 Sensing customer expectations

Hanna & Drea (1998) claimed that understanding the 'customer holistic' view of travel, including cost, comfort and ability to travel when and where customers desire, is important. Many participants commented on understanding customer wants and needs: *"I guess where we started first of all was understanding what customers were looking for"* (Org3: Int8); *"there was a bunch of work that was done on understanding*

from our customers what it was that they wanted” (Org3: Int2); “we’ve got to put that customer hat on and [ask]: is this what the customer wants? What’s our customer going to benefit from this? Rather than just thinking of it as just what’s the cost and dollars in this” (Org3: Int10); and “They didn’t tell us what to do, but they told us that their expectation was that we would meet the customer demand” (Org3: Int4). Understanding customer expectations reveals both gaps and opportunities, which was also acknowledged by participants: “when the surveys are taking place and understand where we might be missing out on opportunities” (Org3: Int4). Identifying major gaps between customer expectations and current service delivery standards could drive a major change resulting in sensing the need for management innovation.

5.4.5.3 Sensing the need to improve customer satisfaction

According to Zbaracki (1998), management innovation is a new set of processes and practices intended to reduce quality defects and improve customer satisfaction. Ming-Horng et al. (2012) claim that higher service innovation increases customer satisfaction. Furthermore, Hansemark & Albinsson (2004) stated that customer satisfaction is an emotional reaction to what customers anticipate and what they receive, regarding their needs, goals or desires.

Organisations constantly measure customer satisfaction to understand customer needs, expectations and experiences and also implement initiatives to improve customer satisfaction by changing business models, structures and associated processes. In this case both the government and the organisation are keen to provide a better experience to passengers. This is achieved by making a ‘step change’ through implementing a customer service model to improve customer satisfaction. Many participants in the case study acknowledged the importance of customer experience, customer satisfaction and perceived value through their comments: *“we also need to*

be making sure that we are doing whatever we can to provide a good experience for our customers which will then obviously grow patronage” (Org3: Int2); “there’s also then a value to the business in that our customer perception and ultimately our customer satisfaction continues to increase” (Org3: Int2): and “previously you would say you’re doing the best for the customer just by making the trains turn up on time. Customers sort of see that as a given” (Org3: Int9). Expectations or perceived value of service are constantly changing and this affects customer satisfaction. Angelova & Zekiri (2011) suggested that service quality and perceived value are the key factors affecting customer satisfaction. Also, Carbone (1998) argued that business must provide a total consumer experience, not just products and service. Perceived value and a total customer experience can directly impact customer satisfaction (Leventhal et al. 2006). Therefore, sensing major declines in customer satisfaction could drive the need for management innovation.

5.4.5.4 Sensing threats

Sensing threats is about the danger of losing business or a need for sustaining the business. This was also recognised by Dottore (2009), who claimed that sensing threats and opportunities could change the organisational environment.

Although the organisation is a state-owned corporation, managers are aware that privatisation could happen. In many major cities, rail network maintenance and rail operations are provided by private organisations. This means that the threat of losing business is always present, and the comments from participants in the case study acknowledged this: *“we’re a government organisation [...] governments can say we’re going to privatise you and that’s the end of it. That threat is always there” (Org3: Int1); and “if we didn’t improve customer service, as measured by [Transport for NSW] or the minister, then the threat was the organisation could be restructured, other parties*

could be brought in to do it for us” (Org3: Int3). Participants not only commented on privatisation, but were also concerned about sustaining adequate funds from government: “we cannot continue to keep our funding at the levels we’ve got it, it’s simply unsustainable” (Org3: Int7); and “the threat was actually a very plain one: we have [financially unsustainable] business” (Org3: Int5).

Participants also recognised the need for efficiency and change: “the final threat was that we needed to deliver an efficiency dividend inside the organisation. So we had to show some savings” (Org3: Int3); and “we will not actually be able to operate without making significant changes” (Org3: Int7). Avolio et al. (1999) and Alvord, Brown & Letts (2004) have also recognised that entrepreneurship and innovation are necessary in order to transform or change these sorts of inputs in profitable ways. The comments show that sensing a threat of losing business due to poor performance can drive the need for management innovation. Although the organisation is a state-owned corporation, managers are aware that privatisation could happen. In many major cities, rail network maintenance and rail operations are provided by private organisations. This means that the threat of losing business is always present. Comments from participants in the case study acknowledged this: “if we didn’t improve customer service, as measured by [Transport for NSW] or the minister, then the threat was the organisation could be restructured, other parties could be brought in to do it for us” (Org3: Int3).

5.4.5.5 Sensing technology needs

Angelova & Zekiri (2011) point out that customers today are different, due to their exposure to information, level of education and familiarity with technology. Technology is constantly advancing and service industries are catching up by using technology to provide better and more immediate service to the customer. Many

researchers have claimed that sensing and envisioning technology can create better customer service and market opportunities (Barney 1991; Covin & Slevin 2002; Kor, Mahoney & Michael 2007a). Using technology to deliver effective customer service was discussed in the comments: *“we have technologies that can take over some of the mundane tasks which sets the expectation of customers saying you need to do something different”* (Org3: Int4); *“we found ourselves at a cross roads where through technology and automation we’ve largely removed the work that has traditionally been done on stations”* (Org3: Int5); *“will be putting in some of the technology that will be the new staffing model which will be there, that the advantage for our customers as well as our staff”* (Org3: Int4); *“we can deliver the same level of service, or a better level of service, with less resources, more technology, you name it”* (Org3: Int1); *“I was astonished when I came in here, nobody had iPhones, so nobody could actually access public information to provide customer service”* (Org3: Int8); and *“our customers used technology on a day-to-day basis through mobile devices, we weren’t interacting with them or providing information to them in that manner”* (Org3: Int3).

It is evident from these comments that the use of newer technology can enable the organisation to provide quicker and accurate information, and better quality services. Technology helps to sustain a competitive advantage for the organisation (Razavi & Attarnezhad 2013) and, therefore, sensing the technology need to improve customer service could drive the need for management innovation.

5.4.5.6 Top management commitment

Participant comments indicate that top management commitment in providing funding and resources for management innovation can take management innovation to the next stage. Bishwas & Sushil (2013) claimed that organisational growth and success is based on continuous integration and funding. Comments made by

participants in the case study noted that top management support and funding is the most important capability. For example, participants commented about the then Minister for Transport driving the change: *“in terms of the customer service initiative, obviously it was a drive coming out of the minister’s office to improve the customer satisfaction rating”* (Org3: Int6); and *“it’s such a significant change in the way we do business, and it did require funding and absolute commitment from the key stakeholders”* (Org3: Int5). This commitment also includes covering the cost involved in management innovation: *“you prepared to fund it, because there are some costs involved? That’s how it was delivered”* (Org3: Int5). It is evident that not only funding but top management support and commitment can drive management innovation.

Coen & Maritan (2011) claimed that the most significant management innovation in a company is to allocate resources. Allocation of human resources and finances would support the success of management innovation. The participating managers in this case study claimed that the top management commitment is also one of the significant driving capabilities to build management innovation in large rail organisations: *“So if you have government that doesn’t support what you want to do then there is no way you can do reform”* (Org3: Int1); *“I suppose the one thing that you definitely need is a strong sponsor, somebody who wants the outcome and willing participants”* (Org3: Int3); and *“So there needed to be a fairly significant senior executive push behind this, on a very constant basis, otherwise it ran the risk of dying off I guess”* (Org3: Int6). When a senior manager sponsors a program or new initiative, there will not be an issue with funding and resources. In addition, comments were also made about the genuine desire for management innovation and strong focus: *“I think it’s a genuine desire, strong sponsor to want to achieve that in [the then minister’s] term”* (Org3: Int1); and *“I think once the strategy was agreed, it certainly needed some pretty strong management focus because [...] those sort of things can very easily lose momentum, so*

there needed to be a fairly significant senior executive push behind this” (Org3: Int6).

When there is a commitment from the executives for funding, resources and strong desire and focus, the management innovation momentum progresses further followed by vision and strategy.

5.4.5.7 Sensing opportunity for cost reduction

Desouza et al. (2008) stated that innovation combines the entrepreneurial and inventive process for creating new economic value. This can be applied to management innovation as well. Improving efficiency could reduce cost, and this was acknowledged by Hsieh (2011) who states that improving efficiency can be achieved through management innovation. Participants in this case study noted that providing cost effective services to customers is important: *“cost is a big driver [...], it’s very expensive to run this place, and labour cost makes up a huge component of our costs” (Org3: Int1); “if you made it a private company, [...] you’d want something that was cost effective, [that] provided a good customer service” (Org3: Int6); “the key was other than delivering what was expected to be delivered, it did allow us to deliver the agreed savings, a profile that we’d signed up to” (Org3: Int5); “so we needed to work out as an organisation how we can actually become profitable” (Org3: Int7); and “I think one of the main drivers is actually probably staff development and unlocking staff potential” (Org3: Int10).*

From these comments, it was evident that managers are looking for opportunities to provide cost effective services. This may be by effectively using resources, using technology or innovation to create commercial value, and therefore sensing cost effective customer service could drive the need for management innovation.

5.4.5.8 Sensing opportunity for business growth

Sensing opportunities for business growth and commercial value was mentioned in

this case study. Some of these comments emphasised the aspects of sensing opportunities such as business growth, performance improvements, and being commercially successful. Many comments were made from a business sustainability point of view: *“there are some elements of it which will drive improved performance in our business in terms of on time train running; so it allows us to derive an economic, or provide an economic benefit back [to the community]”* (Org3: Int3); *“good experience for our customers which will then obviously grow patronage, try to bring the organisation to operate in a more commercially sustainable way than what we do today”* (Org3: Int2); *“There’s also our commercial, as a commerciality I guess, of what we deliver”* (Org3: Int11); *“I’d argue that the organisation should be looking at ways to, even if it’s not making money, it should be looking at ways to minimise costs and run it more commercially”*(Org3: Int2); and *“the idea is obviously to increase the take up of public transport usage”* (Org3: Int6). Therefore, sensing business growth such as growing patronage, commercial competitiveness, and making profits could drive the need for management innovation.

5.4.5.9 Vision and strategy

The interviews suggested that vision and strategy are viewed as key capabilities to drive management innovation to commit and transform the organisation.

Senior management can also foresee the vision and initiate management innovation by creating a vision. The importance and dimensions of vision which can enable the environment for creativity are explained by Martins (1997). The dimensions of organisational culture which can enable the environment for creativity and innovation include:

- mission and vision
- means to achieve objectives (structure and support mechanism)

- image of the organisation
- management processes (decision-making, formulating goals, innovation processes, control processes and communication)
- employee needs and objective
- leadership (Martins 1997).

These dimensions provide a framework for realising the vision. Comments from participants in this case study strongly support the need for vision, purpose and goal: “[The Customer Service Executive Director] had quite a clear vision, and it was a matter of working out how we are going to get there” (Org3: Int1); “painting the picture of what the future brings, and the future being one that’s a staffed model, not an automated model, will give people some confidence that it is what it is” (Org3: Int4); and “at the early stage we had a clear purpose of what we were there for, and the goal we wanted to achieve” (Org3: Int5). Managers not only commented on the vision, purpose and goal but also suggested that a clear strategy should be in place to successfully install management innovation: “we’ve achieved a lot because of the very clear vision and strategy that’s been set by the senior executive, that this is what we’re about, and it has to be from the top-down” (Org3: Int2); “the strategy was clearly communicated, and as I said earlier on it was certainly driven by the senior executive, that didn’t allow it to drop off in terms of its focus” (Org3: Int6); and “I guess our strategies are providing clear information, very much working in partnership with our frontline staff” (Org3: Int11). Many comments strongly supported how vision and strategy drive management innovation.

5.4.5.10 Desire for a major change

Comments from participants in the case study supported the desire or passion for making significant change using an innovative approach: “I think it’s a genuine desire to want to achieve that in [the then minister]” (Org3: Int2); and “interestingly enough a

large part of the innovative thinking, I mean the director is paramount or critical to driving innovation” (Org3: Int7); and “The Customer Service Director [has] driven it from the beginnings. It’s been [the Director’s] vision, and [the Director] is a very proactive driver of change, so [the Director has] been very strong in making sure that it’s going to be rolled out” (Org3: Int11).

The desire for management innovation is extensively discussed in entrepreneurial theory. Top managers look for opportunities that have high value for management innovation (Battilana 2006; Ylinenpaa 2009b). Teece (2007b) also claims that the entrepreneurial behaviour of a manager is about sensing, understanding opportunities and driving new ways of putting things together. Simon et al. (2003) insisted on senior management passion, setting extraordinary goals with close enough fit, and creating the right environment in the organisation as being essential for innovation. Therefore, when there is high value or opportunity or a significant issue to be resolved, and if the situation aligns with management desire for a major change, a management innovation is likely to occur.

5.4.5.11 Business transformation

Transformation happens through inspiration, influence and motivation, which is evident in the literature on transformational and charismatic leadership theories (Avolio et al. 1999; Bossink 2007; Nadler & Tushman 1990). It was also noted that to sustain the transformation, generating innovative culture in a social ecological environment, technical system interaction and transformation is important (Neubaum & Zahra 2006; Olsson, Galaz & Boonstra 2014).

Comments from participants in the case study suggest that culture change and transformation are key capabilities: “I know [Customer Service Director] worked for another large organisation, and had obviously already been through large and

significant cultural and structural transformation programs to bring organisations to be more customer-focused” (Org3: Int2).

Participants commented on business transformation making significant change from current practices and educating people: *“we’re trying to transform how we work in other areas of the business as well”* (Org3: Int1); *“It’s a pretty transformational change, and so yeah I find that it’s been driven from the top-down”* (Org3: Int2); and *“I think also too we spent quite a lot of our time educating people on what the expectation is, and the behavioural and cultural change that we require”* (Org3: Int8).

5.4.6 Developing capabilities

This section explores the interview data on development capabilities for management innovation. Table 5.12 provides the list of development capabilities and number of participants who commented on each capability.

Table 5.12: Case study 3 – Developing capabilities

Developing capabilities	Number of participants who commented
1. Process for management innovation	11/11
2. Resource configuration – working group	11/11
3. Facilitation	10/11
4. Generating ideas	11/11
5. Stakeholder collaboration	11/11
6. Shaping ideas to solution	11/11

5.4.6.1 Process for management innovation

Participants in this case study commented on the innovation process within the development capability for management innovation, including comments noting that the innovation workshops were conducted in a structured manner: *“people mightn’t even realise it, but it did have a very structured approach. Consistent meetings”* (Org3:

Int3). They also highlighted that some research was required to gather necessary information, although few comments confirmed the need for research: *“well it’s not only generating ideas, it’s actually doing research in some ways to determine what options might be feasible for the problem we’re trying to solve”* (Org3: Int3); and *“brainstorming and researching, [...] it’s customer feedback so going out there and doing customer surveys, mystery shoppers and stuff”* (Org3: Int4). Other comments observed that the process also involved story boards: *“it wasn’t a great many workshops, but we ran workshops, worked up story boards, we had this consultant in, then [...] through the workshops we matured the thinking and got some further clarity”* (Org3: Int5). Some participants also thought that it was an evolution: *“I think it was an evolution, there was a recognition that there were issues, there was a strategy developed”* (Org3: Int4).

From the comments reviewed in this case study, the innovation process within the development stages can be summarised in the following steps:

- 1) Planning sessions
- 2) Researching relevant data
- 3) Breaking down issues into several segments
- 4) Presenting to the working group on the context
- 5) Doing focused small group activities
- 6) Having feedback sessions and storyboarding
- 7) Identifying emerging themes and patterns
- 8) Developing conceptual model.

Hering & Phillips (2005) recommended innovation as a five-step process including

generating new ideas, capturing ideas, evaluating ideas, products and services, and launching. On the other hand, Tranfield. et al. (2006) proposed three stages in innovation including discovery, realisation and nourishment stages. However, this case study has revealed an eight-step process within the development stage of management innovation. These eight steps do not include the driving and diffusion capabilities which, as observed by Mol & Birkinshaw (2006), are often overlooked in the management innovation process.

5.4.6.2 Resource configuration – working group

Resource-based view theories describe how resources can be engaged to create capability to respond to a change in the organisation (Teece et al. 1997a). Reconfiguring resources to the need is also discussed in dynamic capability theory (Jianwen et al. 2009). Agarwal & Selen (2009) provided the collaboration view of stakeholders for management innovation.

Comments from participants in the case study insisted on the importance of engaging a diverse working group as an important capability. This group should include various stakeholders, management hierarchy (including senior executives), and a mix of multi-disciplinary and ethnic backgrounds: *“we did actually have a lot of workshops definitely, in terms of you know all the things we needed to do”* (Org3: Int1); *“if you get all of those people together in the one workshop, even if that workshop goes for one or two days, you know the results that they got were really being able to achieve outcomes”* (Org3: Int2); and *“bringing in other senior executive and managers who have also brought with them experiences as to how things can be done in a more nimble, or streamlined fashion”* (Org3: Int2). Working groups were engaged to resolve specific business problems as noted by participants in the case study: *“its whole reason for being is to bring together all of the stakeholders that are involved in solving*

problems or making decisions, and getting them all into the one room and workshopping a particular business problem and the coming up with a solution” (Org3: Int2).

Participants also discussed the working group participants’ hierarchy level, cross-functional role and number of representatives: *“through the whole process, and at different levels, you know at the executive level, at the GM level, at some of these workshops we take a slice through the business, so all the way down and across” (Org3: Int4); “from each of the operating divisions there was different areas that were actually required. [...] it was very much across, it was both vertical and horizontal” (Org3: Int6); and “in terms of the number of people involved in it maybe 15 people to 20 people max who had some idea about what was going [...] were involved in some of the workshops” (Org3: Int6).*

In this case study, managers with different industry experience, who brought a wealth of knowledge to the new environment, were also part of the working group.

5.4.6.3 Facilitation

According to Friedrich et al. (2009), leadership for innovation is required to facilitate at multiple levels of an organisation in the various stages of the creative process. Many researchers have suggested that a charismatic leadership style communicates the need, motivates staff, provides process for innovation and contributes to a new product (Barczak & Wilemon 1989; Bossink 2007; Nadler & Tushman 1990). Comments from participants in the case study highlighted the need for facilitation including specialists, and structured processes to synthesise ideas for management innovation: *“we had some consultants that we worked [...], we also had some other consultants that we worked with” (Org3: Int2); “They were [an] innovation and service design organisation” (Org3: Int3); and “It’s the facilitated process to synthesise ideas and then*

once we had the basic elements, we then brought in [the consultants] to [...] strip that out and represent it at a service level” (Org3: Int3).

5.4.6.4 Generating ideas

According to Amabile et al. (1996), an innovation emphasises the mechanism for changing ideas into something usable and profitable. Many of the researchers emphasised a sharing of tacit knowledge as an important capability for innovation. (Hirai & Uchida 2007a; Howells 1996; Nonaka & Kenney 1991a; Tamer, J & Yushan 2003).

Comments by participants in the case study show that sharing tacit knowledge is one of the most significant development capabilities for management innovation: *“there’s definitely an element of brainstorming indeed. Cause people say what about we look at it from this way, or what about this, what about that” (Org3: Int3); “it’s actually quite a creative, clever way of brainstorming. So you do some individual work” (Org3: Int4); “it was a brainstorming, so it was run by a [consultancy]” (Org3: Int11); “certainly encouraged to provide feedback and ideas and to be part of the process” (Org3: Int6); and “It was really workshopped and it was really brainstorming” (Org3: Int5).*

It was also noted that idea generation is a structured approach to address a specific business problem. Nonaka & Takeuchi (1995) discussed the importance of creating ideas for specific business needs as part of knowledge management theory, and relevant comments from the participants included: *“getting them all into the one room and workshopping a particular business problem and the coming up with a solution” (Org3: Int2); and “getting ideas from people on problems that they, as a group, would like to solve” (Org3: Int9).* Sharing ideas to solve a specific business problem is an important capability for management innovation, as described by the comments above.

5.4.6.5 Key stakeholder collaboration

Researchers have recognised that collaboration with stakeholders, and sharing goals and knowledge are key capabilities for management innovation (Agarwal & Selen 2009; Ayuso et al. 2006a; Gould 2012; Tyagi 2008).

Participants commented on stakeholder collaboration: “the model was developed in collaboration with people in Transport for NSW, led by our directorate obviously” (Org3: Int8); “I looked at the stakeholders that we had well obviously a customer stakeholder group, and the government is certainly a large stakeholder group, and the broad exec team” (Org3: Int4); and “because you’ve got many layers of stakeholders and they’ve each got competing agendas, so just within [the organisation], maintenance, operations all think they should be running the Rail Operations Centre” (Org3: Int7).

Stakeholder collaboration was the key to successfully progressing the development and implementation of a new business model that could bring a major change and this was confirmed by comments from participants: *“particularly the minister [was] very proactive about us putting this initiative in place, and without the minister and Director General ‘buy in’ we wouldn’t have been going anywhere”* (Org3: Int8); and *“That was the first time [the minister had] ever been briefed in Customer Central using that graphic representation instead of [...] getting piles of paper up at the minister’s office. [The minister] actually said to us, I want this to happen all the time”* (Org3: Int11).

Ministerial and government department involvement in framing of the outcome was evident from comments: “I think our biggest stakeholder is actually the minister. In terms of wanting to see change, our minister has been going on and on for some years” (Org3: Int1); and “[Transport for NSW] were heavily engaged in the approach that was adopted in terms of framing part of how we were going to deliver service, [...]

they were engaged in it, and the other parties who were engaged [...] in it was the [Parliamentary] Secretary for Transport and also the minister's office" (Org3: Int3).

These comments show the heavy involvement of key stakeholders is a key capability for developing management innovation.

5.4.6.6 Shaping ideas to solution

Shaping ideas to solution is the mechanism of converting generated ideas to practical solutions. According to Nonaka & Krogh (2009), a knowledge outcome can be converted to a social practice outcome. Ideas are generated randomly or by themes, and these ideas need to be selected and formed into a usable outcome.

Participants in this case study commented on how ideas generated during brainstorming sessions were filtered for both novelty and suitability to the problem in hand: *"we started off with idea planning and particularly on certain initiatives, and also the concept of how those things might draw together... we needed the overarching story that actually pulled all of that together"* (Org3: Int8); *"they then took those ideas and turned them into a pictorial presentation. And helped with developing and refining the concepts that were embedded in the thinking that we'd come up with"* (Org3: Int3); *"we had a whole series of workshops over a couple of months and they all provided content and then we had a [consultancy] then pull that information together into a concept and articulate that in the strategy"* (Org3: Int11); and *"I was saying we got these consultants in who, I think their speciality was, give me a concept, tell me about it, and I'll make you a story board"* (Org3: Int5).

The participants in the case study not only commented on assembling various ideas together, they insisted on the importance of an overall conceptual model or story to

sell the idea to potential users and stakeholders. The case study outcome was established using ideas. This led to a new business model which used the capability of filtering and shaping solutions to opportunity or problem. Shaping a solution requires a mechanism to filter and assemble ideas into a conceptual model which can tell the story and be used to communicate within the organisation at all levels.

5.4.7 Diffusing capabilities

This section explores the interview data on diffusing capabilities for management innovation. Table 5.13 provides the list of diffusing capabilities and number of participants who commented on each capability.

Table 5.13: Case study 3 – Diffusing capabilities

Diffusing capabilities	Number of participants who commented
1. Organisational climate	6/11
2. Top management communication	10/11
3. Staff and union engagement	6/11
4. Management innovation outcome	8/11
5. Management innovation program and governance	4/11
6. Diffusion of management innovation to other situations	8/11

5.4.7.1 Organisational climate

This case study highlights both the change environment and change mindset as being key attributes for creating the right organisational climate to enable the diffusion of management innovation.

According to Leavy (2005) innovative companies share four common climate setting

factors:

- people and ideas are the heart of the management philosophy
- giving people room to grow, learn from mistakes
- building openness and trust
- facilitating the internal mobility of talents.

Similarly, Martins & Terblanche (2003)'s research revealed that the interaction of goals, structures, management, technology and psycho-sociology between individuals and groups within the organisation and external environment determines behaviour in the workplace. Leavy (2005) suggests innovation is based on ideas and ideas come from talented individuals. This talent seeking is referred to as 'bandwidth' in Microsoft, who also recommend hiring a variety of background and personalities.

According to Kerr & John W. Slocum (1987), a reward system can influence culture. A reward system can also change individuals and strengthen relationships. A wide range of supporting literature provides knowledge and insight on innovation within an organisational environment, however evidence from this case study suggests that change environment, opportunity, and government or top management should be driving the change and change of environment. An example of this is innovating by rebranding the organisation. In this case study, the organisation was rebranded into two different organisations, and Customer Service Directorate was created as a new directorate which has provided a new organisational climate for management innovation to take place within the new structure.

Participants in the case study commented that a supportive change environment is important to make a big change. This is because management innovation always forces a significant change in the organisation. Many participants commented on the need for a change environment to drive innovation: *"I suppose there was a huge amount of*

change going on inside the organisation so when there's change there's always opportunity for more change" (Org3: Int3). This environment includes changes of government as stated by one participant: *"new government's come in and they were in opposition for a number of years and were quite critical of our service [...] and so the government's come in and said look we're here and we want to change"* (Org3: Int4).

Change environment was also seen as an opportunity at the organisation: *"we're morphing into Sydney Trains. So I've heard it described as a generational opportunity"* (Org3: Int5). A change in the work environment was viewed by participants as reducing resistance for more change: *"Change people and change technology, and the environment"* (Org3: Int5); and *"whether there is a technology or the station environment [...] and that's going to be the key in terms of embedding this change. Otherwise, if they're resistant to it, it is not going to happen"* (Org3: Int1).

When multiple changes are happening in a business at the same time, it generates 'change momentum': *"I think we've had initial changes, but there's been other things we've been able to do to actually build the momentum that this is changing"* (Org3: Int8). Organisational structural changes, change of government, changes due to technology, new business models and even new business branding can bring other changes which enable innovation. This was captured in comments from participants in the case study: *"I think the branding is a really important part of it. It's much easier to say we're having a new customer service model when you're lining up with a new name"* (Org3: Int9); and *"we had a perfect opportunity with the set-up of Sydney Trains to change direction. So the start of a whole new organisation gave us that catalyst"* (Org3: Int11).

5.4.7.2 Change mindset

Participants in the case study commented on the requirement for change of mindset.

Schneider, Ehrhart & Macey (2014) claim the performance of an organisation depends on the implications of organisational culture, and such changes in the organisation should be taken with a positive mindset by the employees. Comments highlighted how positive mindset is important for change: *“I think it’s about hearts and minds. I think it’s about truly engaging with people early, being very clear that the organisation is changing”* (Org3: Int2); and *“we still [...] need to get people’s hearts, minds and behaviours, especially out in the frontline staff, to [...], think and behave in that way”* (Org3: Int3);

Participants also acknowledged that staff being positive about the change reduces the potential for conflict or resistance to change: *“I think the other opportunity is that our staff are actually very positive about the change”* (Org3: Int11); and *“it will make the job of our staff a bit more interesting as well, provided you get the right mindset”* (Org3: Int1). Also, when staff see the benefit the changes become easy: *“I think it was really one of the first times where people out the frontline started to feel as though they were having a say in making a difference at a local level”* (Org3: Int1); and *“the implementation of the customer service principles to give people something tangible that they could seem to be doing each day”* (Org3: Int9).

It is also claimed by Kaplan & Norton (2001) that, in order to achieve being a strategic-focused organisation in terms of changes, creating a mindset where all the employees look at the strategy as a part of their job is significant. It is also argued by Bushe & Marshak (2014) that any particular instance of development in organisational culture is the outcome of the mindset of the people responsible for the change and people working in it.

5.4.7.3 Top management communication

Top management being able to articulate and communicate the reason for change is

important for supporting innovation. Many participants in the case study insisted that telling the story, and describing reasons and benefits is important. When top management communicates, they should communicate a shared goal, shared ways of thinking, a shared environment, a shared business operating and business model, and describe knowledge and resources (Jaatinen et al. 2005; Mäkelä 2002).

In this case study, participants commented on the need for top management to communicate the purpose and need for change: “The strategy was clearly communicated, and [...] it was certainly driven by the senior executive, that didn’t allow it to drop off in terms of its focus” (Org3: Int6); “well communications, communications and communications, so it started off from the top” (Org3: Int1); “I mean, when you’re introducing change you need to communicate, collaborate, involve people, explain the why” (Org3: Int2); and “selling the message [because] we could just have it sitting in a box, but it’s out there actually selling that message through” (Org3: Int11); and “it’s not just about saying this is the change that we’re making but it’s about telling the story, articulating to the individuals that are going to be involved in it the why we are doing it, what it means for them, what it means for the organisation” (Org3: Int2).

Other comments showed that it was important for the messages to be communicated by various means: “we’re doing a series of these videos at briefing sessions, so every couple of months we’re going to give them a new thing, we’ll be saying well we’ve given you the vision of the future” (Org3: Int4); “there has been things like Platform magazine and communications from the Director. There has been facilitated team meetings” (Org3: Int9); “so in this round we’re trying to beef up the communications and so people are more aware, put some more resourcing behind” (Org3: Int4); “obviously this will present to the minister” (O3: Int1); “presented to the minister for

example and other senior stakeholders in transport” (Org3: Int3); and “Yeah, and in fact we brief the minister using that concept” (Org3: Int11).

Many researchers have insisted that communication is seen as a central success factor for innovations (Luoma-aho & Halonen 2010; Moenaert et al. 2000). This case study revealed how communication can be effective for management innovation by using storytelling with a shared vision, strategy, goals and operating and resource models for all stakeholders.

5.4.7.4 Staff engagement

According to Rowold & Heinitz (2007), transformational leadership motivates and stimulates intellectual influence to make the changes within an organisation. On the other hand, it was evident from the literature that a charismatic leadership style motivates staff, provides a process for innovation, and contributes to creating new products or enabling change in the case of management innovation (Barczak & Wilemon 1989; Bossink 2007; Nadler & Tushman 1990). Evidence from this case study suggests that engaging staff helps to empower people. Collaboration, motivation and communication are vital for engaging staff for management innovation.

Several comments from participants in the case study support this idea: “so it was very much engaging the people and making them not only part of articulating what the problem was, but importantly part of fixing the problem” (Org3: Int2); “I think that’s where the managers are the key to actually getting this across the line and actually sort of motivating staff” (Org3: Int1); and “I think it’s about truly engaging with people early, being very clear that the organisation is changing, that it will have impacts on people, that this is the reason we’re doing it” (Org3: Int2).

Also, evidence from this case study suggests that providing all necessary information

about the change as well as collecting feedback on the progress and collaboration is also part of staff engagement: *“staff information portal, the hubs and all that stuff, they’re all being piloted across and their impact [in each] station at the moment, and then all the station staff [provide] feedback”* (Org3: Int11). Other comments reflected on a collaborative approach: *“I think all of those are people working in a much more collaborative and innovative sort of way, and not necessarily saying why something won’t work but more saying how could it work”* (Org3: Int2).

5.4.7.5 Union engagement

Union representatives are an important stakeholder in most rail organisations. This is because any changes affecting employees must also be discussed with the union. Negotiations with union representatives are also referred to as ‘employee relations’.

Any major change in an organisation can affect these factors. Therefore, it is important to consult a union representative for any planned change. Engaging unions at the early stage of innovation deployment is important. As managers working in a large organisation with a complex structure and a highly unionised environment, the participants in this case study acknowledged the importance of union negotiation: *“we’re a highly [unionised] environment, if we don’t have the key stakeholder support, we will not be able to [...] sustain the things we need to do to make the change”* (Org3: Int2); *“we’ve got to do it up to a point where if we have discussions with unions obviously [...], we can actually answer what we believe are going to be issues that are going to arise”* (Org3: Int1); *“we have to go through this process of consultation with unions and delegates”* (Org3: Int2); and *“this is a highly unionised workforce and there’s very strict protocols around how we need to engage with the unions”* (Org3: Int2).

It was also noted that it was necessary to *“approach it differently from an [employee*

relations] perspective” (Org3: Int4). However, the presentation and content for union engagement were similar to other stakeholders: “how we engaged the unions, in the exact same briefing we gave to the [Chief Executive], to the Director of Finance, was the same one we gave to the union, was the same one we’ve given to frontline management” (Org3: Int4).

The evidence reviewed in this case study indicates that union representatives are one of the key stakeholders for any changes which can affect the employees. Innovation in this environment requires consultation with the unions.

5.4.7.6 Management innovation outcome

Birkinshaw, Hamel, et al. (2008) claim management innovation outcomes can improve productivity and the quality of work life, as well as benefit the organisation and customers. However, these statements are very broad. Evidence from this case study shows that the benefits can be understood as ‘management innovation outcome benefits’ and ‘management innovation approach benefits’. Management innovation outcome benefits are the immediate benefits.

Management innovation does not happen for the sake of introducing new practices, it happens when an organisation is facing a significant problem or a significant opportunity. Therefore, management innovation is introduced over an issue of opportunity which becomes the impetus for initiating management innovation.

Comments from participants in the case study supported the management innovation outcome benefits: “there’s also then a value to the business in that our customer perception and ultimately our customer satisfaction continues to increase” (Org3: Int2); “So if you look at this board over here it is for customer information and intelligence, and all this stuff over here this is what’s tracking all of the innovation that

we're actually bringing into the organisation" (Org3: Int8); and "can we deliver the same level of service, or a better level of service, with less resources, more technology, you name it. In other words, the outcome for the customer is no worse off" (Org3: Int1).

While participants commented on the immediate benefit, the value the outcome has created and the results achieved as result of introducing management innovation, there is also a long-term benefit. According to Hamel (2009), the ultimate constraint to business performance is an organisation's operating model, but management innovation has the capacity to change management practices for long-term advantage. Comments from this case study also support long-term benefits: "*the customer service model [...] and using the hub has changed the way the whole organisation works*" (Org3: Int8); "*it's actually driving a different way of [...] management thinking across the broader organisation as well*" (Org3: Int8); "*this type of methodology – to actually get to where you need to get to*" (Org3: Int9); and "*that's what I think that the significant change has been in the management approach*" (Org3: Int13). In this case study, it is evident that the intent of initiating management innovation has achieved change. Also, the same approach can be diffused to other situations and the new methodology is also another benefit for other management innovations.

According to Birkinshaw, Hamel, et al. (2008), invention in management innovation is experimenting with new hypothetical management practices. In this case study, a new methodology is experimented with for a particular business issue. However, since the approach is new, there is no clear roadmap established at the beginning and the methodology used for management innovation was not defined. In this case study, the approach was hidden behind the issues the organisation was dealing with and the focus was on inventing a new model, as noted in comments from participants: "we

didn't use a particular methodology" (Org3: Int1); and "we spent a fair bit of time developing what we thought was a roadmap to how we were going to get to where we wanted to go" (Org3: Int5).

While comments were unclear about the management innovation methodology, most of the comments from participants were referring to the methodology used to brainstorm ideas for potential solution: *"its whole reason for being is to bring together all of the stakeholders that are involved in solving problems or making decisions, and getting them all into the one room and workshopping a particular business problem and the coming up with a solution" (Org3: Int2); and "I think a lot of the stuff that we did, a lot of the thinking that we did we used the methodology that we took from Customer Central [place where ideation is facilitated], so that methodology involves brainstorming and coming up with solutions to pretty complex issues" (Org3: Int4).*

The methodology used to invent ideas was explained earlier in the development section (Section 5.4.6.1). Kareem (2014) claims that creativity is the discovery of ideas and the ideas can be implemented through project management methodology.

5.4.7.7 New methodology

In this case study, a new methodology is experimented with for a particular business issue. However, since the approach is new, there is no clear roadmap established at the beginning and the methodology used for management innovation was not defined. In this case study, the approach was hidden behind the issues the organisation was dealing with and the focus was on inventing a new model, as noted in comments from participants: *"we didn't use a particular methodology" (Org3: Int1); and "we spent a fair bit of time developing what we thought was a roadmap to how we were going to get to where we wanted to go" (Org3: Int5).*

Comments from participants were referring to the methodology used to brainstorm ideas for potential solution. For example: "its whole reason for being is to bring together all of the stakeholders that are involved in solving problems or making decisions, and getting them all into the one room and workshopping a particular business problem and the coming up with a solution" (O3: Int2); and "I think a lot of the stuff that we did, a lot of the thinking that we did we used the methodology that we took from customer central, so that methodology involves brainstorming and coming up with solutions to pretty complex issues" (O3: Int4).

Evidence also suggests that external companies were involved in setting up a dedicated facility, facilitating innovative workshops, and supporting development of the new customer service model: *"[the consultants] had their version of the hub and we would hire that out at a cost"* (Org3: Int7); *"Customer Central had that 'MG Tyler type' methodology"* (Org3: Int7). MG Tyler methodology is a process for innovation workshops to generate ideas and select solution. The dedicated facility was known as the Hub, and then its name was changed to Customer Central. *"I think we used a bit of the MG Tyler methodology"* (Org3: Int9); and *"once we had the basic elements, we then brought in [consultants] to sort of, strip that out and represent it at a service level"* (Org3: Int3).

5.4.7.8 Management innovation program and governance

Comments from participants in the case study also suggested project management as a methodology to implement the outcome of management innovation: *"agile is a project methodology for how you go about running a project. So what they refer to as traditional project management is known as like a waterfall methodology"* (Org3: Int2); and *"it gets driven through project management techniques if you like, to provide a core, to make sure that we keep focused on the end result"* (Org3: Int3). Many

researchers have claimed that project management has a strong relationship with innovation in terms of initiating, planning, monitoring, executing and closing (Fagerberg et al. 2008; Kavanagh & Naughton 2009).

Many participants highlighted that a 'Six Sigma' approach was not used. For example: "[there] certainly wasn't any Six Sigma" (O3: Int5); "the Six Sigma stuff we haven't really touched yet" (O3: Int7). The evidence suggests that there is not any clear framework for management innovation other than external organisations using their own methodology for engaging stakeholders, running workshops, collecting ideas and assembling ideas to potential solutions.

5.4.7.9 Diffusion of management innovation to other situations

At the time of this case study in 2014, the customer service case study has commenced only recently, and there is not yet concrete evidence for theorising and labelling this approach as management innovation. It may take years to realise the benefits, and when a commercial interest emerges to implement the concept, additional theorising and labelling may occur. Similar to O'Mahoney (2007), diffusing management innovation requires long-term interaction between many stakeholders, including consultants, decision-makers, organisations, documentation and networks, to form an ontological ecosystem which can reciprocate the newly formed ideas.

According to O'Mahoney (2007), little attention is traditionally paid to the diffusion of management innovation. This is also supported by Birkinshaw, Hamel, et al. (2008) who claim there is little knowledge of diffusion of management innovation and how it was generated. Evidence from this case study suggests that management innovation is initiated due to a significant issue or opportunity which becomes the pilot project to drive management innovation.

To diffuse management innovation effectively, the pilot project needs to be successfully implemented. To diffuse management innovation, it may take years to understand the benefits of applying the new methodology to other situations. The customer service model is not fully implemented and the process, and capability, that enabled the customer service model is not explicit at this stage. However, some participants acknowledged that the management innovation approach could be diffused to other situations: *“how it was transformed into an ongoing program [...] for me we’re just starting to do that”* (Org3: Int1); and *“it’s actually driving a different way of thinking, management thinking across the broader organisation as well”* (Org3: Int8). Participants also recognised that the outcome of this case study report can be scaled to other organisations: *“what you’re recording is probably the best record of how this can be scaled to other organisations”* (Org3: Int3). One of the participants also commented on labelling the program, that it is a personal vision: *“I’m saying I guess is that it is hard to label personal vision and personal inspiration either from a dynamic leader or a set of dynamic leaders”* (Org3: Int10).

5.4.8 Conclusion of case study 3

The capabilities that could promote management innovation in rail organisations were analysed using three stages: driving capabilities, developing capabilities and diffusing capabilities. The case study also examined capabilities associated with each of these stages to analyse specific enabling capabilities for management innovation.

Table 5.14 summarises the capabilities discovered from the customer service model case study.

Table 5.14: Capabilities discovered from the customer service model case study

Management innovation stages	Enabling capabilities
Driving capabilities	<ul style="list-style-type: none"> Sensing the need to improve customer service Sensing customer expectations Sensing the need to improve customer satisfaction Sensing the threats Sensing technology needs Top management commitment Business transformation Vision and strategy Desire for a major change Sensing opportunity for cost reduction Sensing business growth Sensing threats of losing business
Developing capabilities	<ul style="list-style-type: none"> Process for management innovation Resource configuration – working group Facilitation Generating ideas Stakeholder collaboration Shaping ideas to solution
Diffusing capabilities	<ul style="list-style-type: none"> Organisational climate Change mindset Top management communication Staff and union engagement Management innovation outcome New methodology Management innovation program and governance Diffusion of management innovation to other situations

5.5 Cross Case Study Comparison

The three case studies conducted in three large rail organisations in New South Wales, Victoria and Queensland are summarised in this section. The three case studies selected for this research are significant in terms of staff impact, substantial shifts in the way the rail industry operates, and tens of millions of dollars spent to implement the outcomes. The three case studies were eliminating level crossing incidents, establishing a Centre of Excellence in train maintenance, and developing a new customer service model for passenger rail operations.

The literature review led to the construction of a proposed Management Innovation Capability Framework outlined in Chapter 3. The framework consist of three stages: driving capability, developing capability and diffusing capability. The three case studies enabled in-depth exploration which showed that there are two types of driving capabilities: capabilities that drive top management to discover the need for a management innovation and capabilities that drive the management innovation forward in the organisations. Similarly the diffusing stage also can be viewed as two stages: the deploying of the outcome of management innovation and diffusing to other situations. Therefore, the framework can be understood better as five stages: **discovering, driving, developing, deploying and diffusing**. These five stages of management innovation capabilities are discussed in the following sections.

5.5.1 Discovering capabilities for management innovation

This section summarises the capabilities that enable the discovery of the need for management innovation. Table 5.15 illustrates the comparative capabilities discussed in all three case studies.

Table 5.15: Comparative results – Discovering capabilities

Discovering capabilities		
Case Study 1 (Organisation 1) Eliminating level crossing incidents	Case Study 2 (Organisation 2) Establishing a Centre of Excellence	Case Study 3 (Organisation 3) Introducing a customer service model
<ul style="list-style-type: none"> • Sensing opportunities • Sensing threats • Sensing technology needs • Entrepreneurial alertness 	<ul style="list-style-type: none"> • Sensing opportunities • Sensing threats • Sensing technology needs • Entrepreneurial alertness 	<ul style="list-style-type: none"> • Sensing the need to improve customer service • Sensing customer expectations • Sensing the need to improve customer satisfaction • Sensing the threats • Sensing technology needs • Sensing opportunity for cost reduction • Sensing business growth • Sensing threats of losing business

All three organisations sensed opportunity for management innovation through various circumstances: organisation 1 sensed the need for management innovation through safety incidents and associated risk and safety threats, organisation 2 sensed through the opportunity of having a new maintenance plant and new staff the opportunity to introduce a new management model and innovation culture, and organisation 3 sensed opportunity through a major reform to introduce a new customer service model. Researchers have recognised the importance of sensing the need for management innovation (Benner & Tushman 2003a; Danneels 2008; Jansen et al. 2009; Martin 2011; Miller 2002; Rindova & Kotha 2001a; Taylor & Helfat 2009; Verona & Ravasi 2003).

Significant opportunities and threats can alert senior executives to sense and discover the need for innovative solutions based on the significance of threats and potential

business opportunities. In terms of threats, the level crossing incidents case study is a good example of how safety, business reputation and compliance risks encouraged management to look for innovative solutions, whereas the other two case studies illustrate how management innovation was initiated due to significant opportunities resulting in benefits and positive reputations, commercial advantage and customer experience.

In the customer service model case study, participants commented more about sensing customer related needs, understandably as it was the topic of that case study. Three areas were discussed by the participants about understanding customer needs including quality of service (Lee & Hwan 2005), customer satisfaction, (Ming-Horng et al. 2012) and understanding customer expectations (Hanna & Drea 1998).

Few staff commented about sensing opportunity through technology needs and gaps of not using technology to increase quality of services and improve performance. Many researchers have emphasised the need to sense technology for innovation (Aldrich & Martinez 2001; Benedetto, S.DeSarbo, et al. 2008; Razavi & Attarnezhad 2013).

Top management commitment was expressed by the participants in various forms of support including allocating resources Coen & Maritan (2011), providing funding Bishwas & Sushil (2013), providing direction (Bossink 2007; D'Amato & Roome 2009), setting clear vision and goals and appointing an internal change agent (Mol & Birkinshaw 2006).

The participants in the level crossing and Centre of Excellence case studies commented on entrepreneurial alertness. Participants in the customer service model case study discussed it in a similar way but in more detail including the importance of growing

patronage, operating as a commercially competitive organisation and sustaining business and also commented on chances of losing business if they failed to improve quality of service and customer satisfaction. Desouza et al. (2008) suggest that entrepreneurial alertness is creating value to customers and economic value to the organisation.

5.5.2 Driving capabilities for management innovation

This section summarises the capabilities that enable the driving of the need for management innovation. Table 5.16 illustrates the comparative driving capabilities discussed in all three case studies.

Table 5.16: Comparative results – Driving capabilities

Driving capabilities		
Case Study 1 (Organisation 1) Eliminating level crossing incidents	Case Study 2 (Organisation 2) Establishing a Centre of Excellence	Case Study 3 (Organisation 3) Introducing a customer service model
<ul style="list-style-type: none"> • Top management commitment • Appointing internal change agent • Vision and desire for major change • Taking risk 	<ul style="list-style-type: none"> • Top management commitment • Appointing change agent • Vision and strategy 	<ul style="list-style-type: none"> • Top management commitment • Business transformation • Vision and strategy • Desire for a major change

Once the need for management innovation is sensed, top management’s commitment drives the management innovation. Vaccaro et al. (2012) have also recognised that top management has a prominent role within organisations, and the ability to greatly influence management innovation. Similarly, Bossink (2007) noted that a strategic leadership style provides top management commitment to support innovation. In all three case studies, it was evident that senior executives (chief executive, directors and

general managers) with a strategic view have initiated the management innovation approach through finding a new approach to management to resolve the problem or realise the opportunity. The scale of opportunity or threat should be significant enough to get top management's attention and provide justification for sponsoring a management innovation.

In all three case studies, it was also evident that the senior executives appointed a senior manager as an internal change agent to drive management innovation in the organisation. The sponsor's representative, usually at general manager level, acted as an internal change agent with authority for allocating funding and resources and making decisions on behalf of the sponsor. Similar findings by Birkinshaw, Hamal, et al. (2008) noted that appointing an internal change agent can set the business agenda to drive management innovation. A change agent with transformational leadership capability will facilitate transformation by inspiration, motivation, influence, intellectual stimulations and individual consideration. Only the customer service model case study participants discussed business transformation through inspiration, influence and motivation, which is also discussed in transformational leadership theories (Avolio et al. 1999; Bossink 2007; Nadler & Tushman 1990).

All three organisations supported the need for 'desire for a major change'. For example, since the invention of rail transport, no rail organisations have thought about building level crossings differently. The level crossing 'boom gate' design is still the original design and it is difficult to eliminate level crossing incidents without building expensive overbridges for every single level crossing, which is not an economic solution. In this case, the CEO expected a radical outcome of eliminating level crossing incidents by engaging a management innovation approach to invent a radical solution. That radical innovation takes place very rarely, combining a business model and

technology innovation to generate new industries with major exponential growth, was acknowledged by Helfat et al. (2007) and Chen, and & Lay (2009). All three case studies have evidence demonstrating combining technology and a new business model. Many researchers supported the view of 'expecting radical outcome' being the most effective way of improving performance or achieving the expected outcome (Klein & Sorra 1996; Merrill 2008; Morris 2008; Sheremata 2004a; Winter & Zollo 2002).

All three organisations acknowledged 'vision and strategy' as one of the capabilities for driving management innovation. The literature supports the need for a strategy, particularly when a radical outcome is expected and management innovation is usually about making big changes within an organisation by changing or introducing a new business model or principle. Therefore, building radical expectations into the management strategy is vital, otherwise this will be overlooked in relation to other business priorities. Armitage & Scholey (2006) recognised that 'strategy mapping' has played an important role in driving successful innovation. Similarly, (Belias & Koustelios 2014) studied the impact of change management strategy and identified that 'organisational change strategy' is an important capability for driving a successful innovation and could apply for management innovation as well.

The findings above support the hypothesis 'Sensing opportunities or threats enables the discovery of management innovation in large rail service organisations'.

5.5.3 Developing capabilities for management innovation

This section summarises the capabilities that enable the development of the need for management innovation. Table 5.17 illustrates the comparative developing capabilities discussed in all three case studies.

Table 5.17: Comparative results – Developing capabilities

Developing capabilities		
Case Study 1 (Organisation 1) Eliminating level crossing incidents	Case Study 2 (Organisation 2) Establishing a Centre of Excellence	Case Study 3 (Organisation 3) Introducing a customer service model
<ul style="list-style-type: none"> • Innovation process • Taskforce • Facilitation • Roles and responsibilities • Generating ideas • Stakeholder collaboration • Shaping ideas to solution 	<ul style="list-style-type: none"> • Process for management innovation • Resource configuration • Facilitation • Generating ideas • Stakeholder collaboration • Shaping ideas to solution 	<ul style="list-style-type: none"> • Process for management innovation • Resource configuration – working group • Facilitation • Generating ideas • Stakeholder collaboration • Shaping ideas to solution

The case studies demonstrate that all three organisations are aware that a process is required to develop a conceptual idea into reality as recommended by Mol & Birkinshaw (2006). Management innovation requires a systematic approach encompassing processes and methods (Hamel 2006). In all three case studies, the management innovation process was developed by internal expertise, and external consultants using a ‘trial and error’ approach. This was also identified in research by Birkinshaw, Hamal, et al. (2008), who found that the internal change agent develops new practice, problem-driven search, ‘trial and error’ and ‘idea linking’ with external change agents.

Although brainstorming was the fundamental tool used to generate ideas in all three case studies, the ‘methodology and systemic’ approach was evident with variations from organisation to organisation. Many researchers acknowledge that methodology provides a systematic approach, process and methods that become part of an ongoing program of creative solution for management innovation (Feigenbaum & Feigenbaum 2005; Hamel 2006; Mol & Birkinshaw 2006; Parsons 1991).

Engaging a working group is a vital capability. Evidence from all three case studies indicates that 'engaging working group' to develop innovative ideas for identified problems and opportunities is viewed as an important capability to develop management innovation. The number of staff in working groups from the three case studies varied from 6 to 22, and the size of the group was related to the size and complexity of the organisation, and significance of the problem or opportunity. Many researchers in dynamic capability theory acknowledge that internal and external resources are reconfigured to address strategic needs of an organisation and for value creation (Eisenhardt & Martin 2000a; Rindova & Kotha 2001a; Teece et al. 1997a; Teece 2007a; Zahra et al. 2006). This is also referred to as a resource-based view. Engaging the resource to develop management innovation was also evident in the naming of the working groups. The working group in the level crossing case study was known as 'taskforce', in the Centre of Excellence case study it was known as 'expert practitioners' and in the customer service model case study it was just referred to as 'working group'. All three case studies indicate that diversity in the working group can bring better outcomes, eliminate group thinking and encourage constraint-free thinking and provide outside the box ideas. Dreu, Bechtoldt & Nijstad (2006) analyse the methods of team personality diversity and group creativity in management innovation. Cognitive diversities such as abilities, knowledge and skills create a positive environment for the innovation. In all three case studies, it was evident that staff from various hierarchy levels of the organisation and with various skill sets and background participated in working groups. For example, senior managers, administrative staff, engineers, accountants and staff in various age groups and ethnic backgrounds were also part of the working group as diversity of working groups brings constraint-free thinking and better outcomes. Another observation in the working groups was that top management's participation created motivation and recognition. Feelings of identity

and diversity are also recognised by Martins & Terblanche (2003), who state that a feeling of identity among staff is the important factor in developing management innovation. Diversity helps to overcome the group thinking factor.

All three case studies supported the need for change facilitation. In all three cases, the sponsor representative appointed facilitators. This included internal facilitators to run innovation workshops and external consultants to facilitate new methodology, train staff in critical thinking and facilitate innovation workshops. Facilitators also assisted in developing methodology to filter ideas to further develop novel ideas into a practical solution. The facilitation capability was evident in literature. For example, Bossink (2007) insists that top management commitment and facilitation of innovation capabilities are the two most important aspects of strategic leadership. Many leadership theories suggest that facilitation is one of the roles of a leader for innovation (Friedrich et al. 2009; Nonaka & Kenney 1991b), in particular transformational leadership theory transforms the organisation by motivation, inspiration and facilitation (Fleishman, Mumford, Zaccaro, Levin, Arthur L. Korotkin, et al. (1991). In terms of management innovation, Birkinshaw, Hamel, et al. (2008) suggest that the internal change agent is needed to facilitate and to realise the conceptual idea and transform it into a practical application. Observation from all three case studies suggests that a senior executive was appointed as the change agent and also a facilitator was recruited from overseas or local experts were used to facilitate management innovation.

Once the methodology is developed for generating ideas and a working group is formed, the next step within the development capabilities is to generate ideas, collaborate with stakeholders and shape ideas to potential solutions. Participants from the level crossing and customer service model case studies were noticeably supportive

of 'key stakeholder collaborations' as an important capability. The organisation in the customer service model successfully implemented the innovation outcome because the key stakeholders, such as the government, the minister and relevant department, were involved and supportive in terms of funding and driving the change. The organisation in the level crossing case study engaged stakeholders at a later stage as there was a significant delay in getting the funding and approval from the government to pilot the outcome.

The importance of packaging the solution into a simple model was highlighted with comments from participants in the customer service model case study that mentioned shaping the solution using selected ideas, while participants in the level crossing case study also commented on shaping multiple ideas to the solution and the outcome. It is evident that all three capabilities discussed in this section enabled the organisations to generate, share and shape ideas while engaging key stakeholders who can potentially sponsor and support the implementation of management innovation ideas.

Howells (1996) and Nonaka & Kenney (1991a) posit that sharing tacit knowledge is key to innovation and knowledge sheds light on creativity, learning and change. All three case studies have strong evidence of sharing ideas while very little or negligible evidence on sharing explicit knowledge. There is also strong evidence that all three cases shared tacit knowledge for a specific business need. The common attributes among all three case studies include 'sharing innovative ideas for specific business need' and 'shaping the ideas to the need'. For resolving management issues or realising a significant opportunity it was evident that 'idea gathering' should be specific to the business need and multiple ideas can be shaped to provide breakthrough solutions as expected in the driving capability to provide a radical outcome.

Within knowledge management, sharing tacit knowledge, rather than explicit

knowledge, is seen as an important capability for management innovation. Similarly, Alwis & Hartmann (2008) studied the use of tacit knowledge within innovative companies and identified that tacit knowledge contributes competitive advantage to innovation management, and recognised that it is difficult to codify in the blueprint or operating manual used to sustain the profit in the organisational performance. Panahi et al. (2012) also analysed the importance of tacit knowledge-sharing in the needs of business and organisational performance. Tacit knowledge-sharing is associated with social interactions and informal relationships and people networks. Many researchers in knowledge management emphasise the importance of tacit knowledge as the key to innovation and agree that tacit knowledge is the most important knowledge type for learning, creativity and innovation (Brown & Eisenhardt 1997; Hirai & Uchida 2007a; Howells 1996; Nonaka & Kenney 1991a; Teece et al. 1997a).

The importance of stakeholder collaboration for sharing goals and knowledge and economic benefits is acknowledged by researchers as one of the key capabilities for management innovation (Agarwal & Selen 2009; Ayuso et al. 2006a). Tyagi (2008) posits that collaboration finds new synergies to harness the capability and creativity of other organisations. Evidence from all three case studies indicates that a collaborative approach for developing management innovation is vital. Many researchers have found that collaboration with stakeholders and sharing knowledge are key capabilities for management innovation (Agarwal & Selen 2009; Ayuso et al. 2006a). However, findings from the level crossing and customer service model case studies indicate that stakeholder collaboration is more than sharing knowledge, it is about keeping the sponsoring stakeholder involved from the beginning so that they can fund and support the outcome, otherwise the innovation stops at inventing a potential solution, not implementing the solution.

In each organisation, working groups generated a multitude of ideas to resolve one business issue, evaluated ideas for innovative solutions, and compiled multiple ideas and shaped these into potential solutions. According to Hartmann (2006), ‘idea refining’ is an important technique used to validate and align conceptual ideas towards a potential solution. In the case studies on eliminating level crossing incidents and introducing a customer service model, it was clear that a systematic methodology was used for shaping ideas towards achieving the management innovation goal. Also, two of the three case studies had evidence that a simple model was constructed to communicate a complex solution in a simple manner at all levels in the organisation, including executives, the frontline and all stakeholders.

The findings above support the hypothesis ‘Process, resources, facilitation and idea generation enable the invention of a management innovation’.

5.5.4 Deploying capabilities for management innovation

This section summarises the capabilities that enable the deployment of the need for management innovation. Table 5.18 illustrates the comparative capabilities discussed in all three case studies.

Table 5.18: Comparative results – Deploying capabilities

Deploying capabilities		
Case Study 1 (Organisation 1) Eliminating level crossing incidents	Case Study 2 (Organisation 2) Establishing a Centre of Excellence	Case Study 3 (Organisation 3) Introducing a customer service model
<ul style="list-style-type: none"> • Organisational climate • Top management communication • Staff and union engagement 	<ul style="list-style-type: none"> • Organisational climate • Top management communication • Staff motivation • Staff and union engagement 	<ul style="list-style-type: none"> • Organisational climate • Top management communication • Staff and union engagement

The importance of organisational climate to introduce a management innovation was evident in all three case studies. For example, all three cases were initiated after a major change in the organisation or a major catastrophic incident which acted as a climate for change either with the emotional mindset in the case of catastrophic incidents on level crossings or major reform in the cases of the customer service model and Centre of Excellence including new staff, new facilities, new brand and new leadership with experience from other industries rather than rail organisations.

The findings from all three case studies support the need for communicating the need for management innovation. Communication reduces conflicts, increases awareness, increases collaboration, and drives the necessary change when a major reform is introduced through management innovation. Top management communication includes communicating the need for change, keeping staff informed about the changes, and consultation with relevant staff about the impacts – using internal communication sources such as newsletters, road shows, cascading information down through meetings and toolbox talks.

Participants in all three case studies commented on the need to engage staff and unions. Staff are engaged at various stages including forming working groups, general updates and communication. Unions are also engaged from the beginning as the employee representative to support the changes. When staff and the union are engaged from the beginning they support and convince other staff and prepare for the change. Union representatives assess the impact and associated changes to employment conditions including wages, work environment and staff safety. Odhong & Omolo (2014) posit that collective bargaining, remuneration, recruitment, communications and safe working conditions are key influencing factors for employee relationships. Unions can negotiate the change conditions arising from any impacts on

these factors. Evidence from the case studies indicates that union representatives are key stakeholders for any changes which can affect the employees. It is clear that innovation in large rail organisations requires consultation with the unions.

The findings above support the hypothesis ‘Staff motivation, consultation, communication and the environment enable the deployment of management innovation’.

5.5.5 Diffusing capabilities for management innovation

This section summarises the capabilities that enable the diffusion of the need for management innovation. Table 5.19 illustrates the comparative capabilities discussed in all three case studies.

Table 5.19: Comparative results – Diffusing capabilities

Diffusion capabilities		
Case Study 1 (Organisation 1) Eliminating level crossing incidents	Case Study 2 (Organisation 2) Establishing a Centre of Excellence	Case Study 3 (Organisation 3) Introducing a customer service model
<ul style="list-style-type: none"> • Management innovation outcome • Program and governance 	<ul style="list-style-type: none"> • Management innovation outcome • Program and governance 	<ul style="list-style-type: none"> • Management innovation outcome • New methodology • Program and governance • Diffusion of management innovation to other situations

The diffusion of management innovation happens when management realises the benefits of the new approach and uses the same management innovation process or model to meet other business needs. For example, after realising how management innovation can provide a solution for eliminating level crossing incidents, the organisation applied the same process to improve rail track safety. In the second case

study, the organisation was planning the same Centre of Excellence with other maintenance facilities at the time of the case study. In the third case study, there was evidence that the organisation was using a similar customer service model approach in other parts of the organisation and the organisation achieved significant improvement of customer satisfaction and sustained this improvement over three years (Transport_NSW 2015). In all three case studies, there was significant support for using business-as-usual processes such as project management or governance.

The finding above supports the hypothesis 'The outcome of management innovation benefits organisations'.

5.5.6 Conclusion

Management innovation capability has an important role in building management innovation in large rail organisations. Top management sensing the need for management innovation is the primary capability to initiate an innovative approach to a significant problem or opportunity. Customer and stakeholder needs and technology trends also contribute to sensing the need for change. When top management senses a significant gap in the products and services they deliver to customers, or outdated technology, the need for change becomes obvious. Once top management senses and seizes the need for change, the commitment to change and anticipation to achieve a radical outcome advances the management innovation to the next level. This involves communicating the need for change and appointing a sponsor's representative with the transformational leadership skills and authority to allocate funds and resources to address the problem or opportunity.

The internal change agent acts as a change catalyst and engages external consultants and facilitates an internal working group. The change catalyst, along with the external

change agent, develops a methodology in which the working group can be trained, for generating ideas and providing guidance to validate potential solutions. It was also observed that many ideas needed to be aligned to provide an innovative solution to the organisational need. The outcome of management innovation can be implemented using a regular organisational implementation methodology such as project management.

5.5.7 Summary of capabilities

Capabilities aligned to the management innovation stages are summarised in Table 5.20 below and they are further tested to validate using quantitative analysis.

Table 5.20: Summary of capabilities

Management innovation stages	Enabling capabilities
Discovering capabilities	<ul style="list-style-type: none"> Sensing the need to improve service quality Sensing customer expectations Sensing the need to improve customer satisfaction Sensing the technology need Sensing the need for entrepreneurial alertness Sensing the need for cost reduction Sensing the need for business growth Sensing threat of losing business
Driving capabilities	<ul style="list-style-type: none"> Vision and strategy Top management sponsorship Top management support and funding Top management desire for innovation Taking risks Appointing change agent or sponsor representative Commitment for business transformation
Development capabilities	<ul style="list-style-type: none"> Management innovation process Taskforce or working group Facilitation by experts Generating ideas Key stakeholder collaboration Shaping ideas to solution
Deployment capabilities	<ul style="list-style-type: none"> Change environment Change mindset Top management communication Engaging staff Engaging union Staff motivation
Diffusion capabilities	<ul style="list-style-type: none"> Management innovation outcome and benefits New methodology for management innovation Program and governance Diffusion of management innovation to other situations

5.6 Survey Research

Survey research was conducted in all three participating organisations to confirm the case study findings. The target audience for the survey included executives, general managers and senior managers.

The case study findings identified enabling capabilities and assisted with expanding the Management Innovation Capability Framework to five stages of discovering, driving, developing, deploying and diffusing. The purpose of the survey was confirmatory only, not intended to further explore additional capabilities as the three case studies provided adequate information to construct the framework. Therefore descriptive analysis and confirmatory factor analysis are used to describe the data results and analyse the data variables from the survey. There are five data sets used based on the five stages of the framework. The results of the survey are discussed in the following sections.

5.6.1 Descriptive analysis

5.6.1.1 *Discovering capabilities*

Hypothesis 1: Sensing opportunities or threats enables the discovery of management innovation in large rail service organisations.

From the qualitative case study research, a number of capabilities were identified and it is evident that sensing opportunities or threats for management innovation is important to drive management innovation in large rail service organisation. It is also evident that the need for a management innovation can be triggered from various sources, including sensing the need to improve service quality, understanding gaps in customer expectations, sensing to improve customer satisfaction, sensing technology needs, entrepreneurial alertness, opportunity for cost reduction, sensing opportunity

for business growth, and sensing threats to business.

Figure 5.3 shows the survey responses on discovering capabilities.

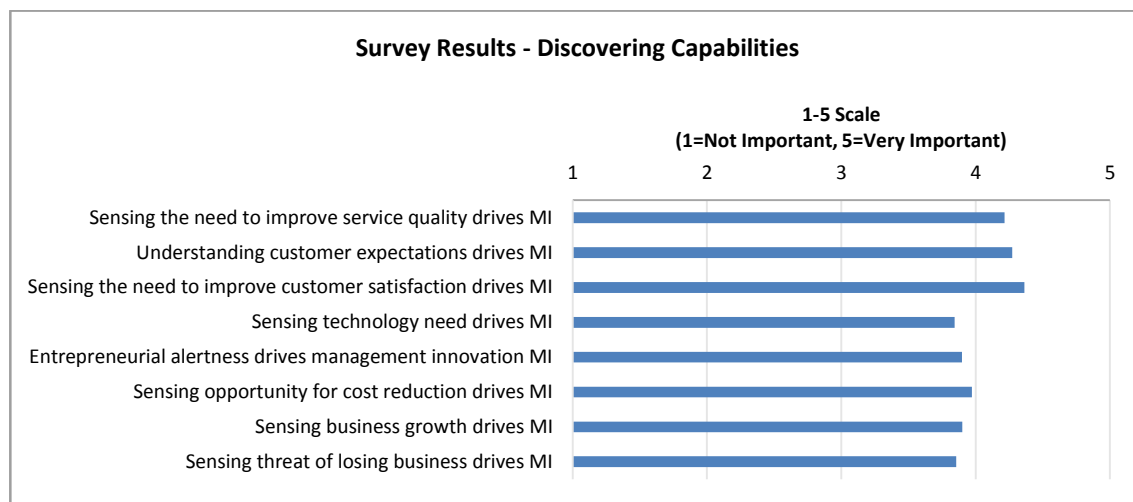


Figure 5.2: Survey results of discovering capabilities

The survey results indicate that all identified capabilities are positive and are important.

Table 5.21: Descriptive analysis – Discovering capabilities

Discovering Capabilities	Mean	Standard Deviation	Number of Response
Sensing the need to improve service quality drives MI	4.21	0.587	70
Understanding customer expectations drives MI	4.27	0.721	70
Sensing the need to improve customer satisfaction drives MI	4.36	0.727	69
Sensing technology need drives MI	3.84	0.911	70
Entrepreneurial alertness drives management innovation	3.90	0.987	69
Sensing opportunity for cost reduction drives MI	3.97	0.900	70
Sensing business growth drives MI	3.90	0.871	70
Sensing threat of losing business drives MI	3.86	0.845	69

Table 5.21 shows that ‘sensing the need to improve customer satisfaction’ is the most important discovering capability ($M = 4.36$, $SD = 0.73$) followed by ‘understanding customer expectations’ ($M = 4.27$, $SD = 0.72$). The least significant driver is ‘sensing technology needs’ ($M = 3.84$, $SD = 0.91$). Standard deviation values show that the responses about customer satisfaction and customer expectations driving

management innovation are spread out (from average) in a similar way (SD = 0.73 and SD = 0.72 correspondingly) and sensing the need to improve service quality has the lowest variance (SD = 0.59) while ‘entrepreneurial alertness drives management innovation’ has the largest standard deviation (SD = 0.99), with the responses of managers varying from ‘not important’ to ‘very important’.

The correlation matrix in Table 5.22 shows that there are positive correlations amongst all the discovering capabilities.

Table 5.22: Correlation matrix – Discovering capabilities

	Sensing the need to improve service quality drives MI	Understanding customer expectations drives MI	Sensing the need to improve customer satisfaction drives MI	Sensing technology need drives MI	Entrepreneurial alertness drives management innovation	Sensing opportunity for cost reduction drives MI	Sensing business growth drives MI	Sensing threat of losing business drives MI
Sensing the need to improve service quality drives MI	1.000	.434	.532	.341	0.191	.366	.307	.385
Understanding customer expectations drives MI		1.000	.475	.294	0.149	0.157	.295	0.159
Sensing the need to improve customer satisfaction drives MI			1.000	.359	0.218	0.233	0.208	.304
Sensing technology need drives MI				1.000	.346	.236	.338	.259
Entrepreneurial alertness drives management innovation					1.000	0.171	.275	.320
Sensing opportunity for cost reduction drives MI						1.000	.411	.321
Sensing business growth drives MI							1.000	.324
Sensing threat of losing business drives MI								1.000

There is a moderate correlation between sensing the need to improve service quality and sensing customer satisfaction and understanding customer expectation. Sensing business growth and sensing the opportunity for cost reduction also has a moderate correlation. The majority of the capabilities are weakly correlated. Of interest are weak correlations between entrepreneurial alertness and understanding customer

expectations, cost reduction and service quality. Similarly there are weak correlations between cost reduction and understanding customer expectations.

The analysis shows that sensing customer needs, service quality and customer satisfaction, business growth and cost reduction are the important issues for rail organisations. Over many decades, rail organisations have focused on reliability and safety as basic and vital to operating railways. Now the focus is on improving customer satisfaction by providing better services at a competitive cost, management innovation may be triggered from any of these capabilities or combinations of multiple capabilities. Once the need is sensed and the management is committed, they may support to drive the management innovation forward.

5.6.1.2 *Driving capabilities*

Hypothesis 2: Top management commitment drives management innovation forward in large rail organisations.

Few capabilities that enable management innovation to be taken to the next step were identified in the literature and from the case studies. These capabilities include commitment to business transformation, a change agent, risk taking, top management desire for innovation, providing support and funding, sponsorship and driving with clear vision and a strategy for management. Figure 5.4 shows the survey responses on driving capabilities.

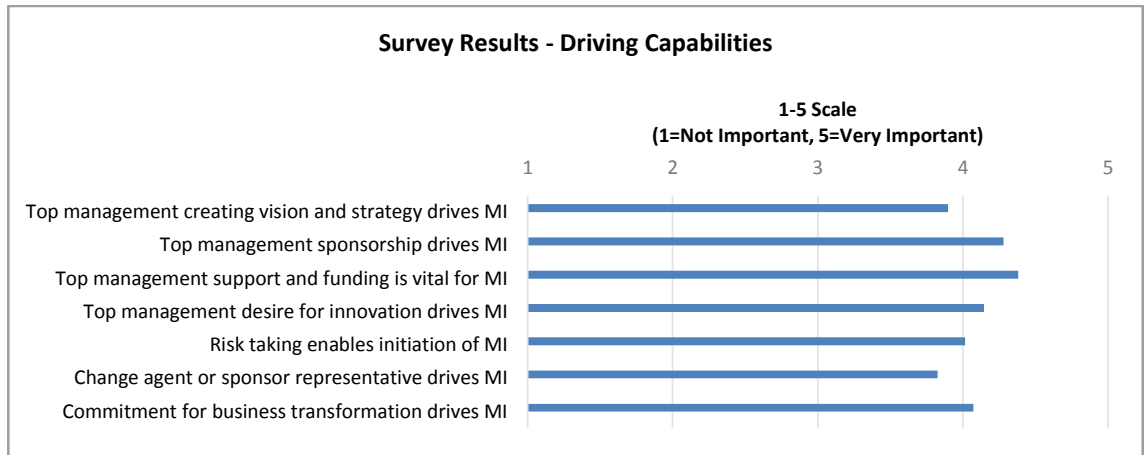


Figure 5.3: Survey Results of Driving Capabilities for MI

Table 5.23: Descriptive analysis – Driving capabilities

Driving Capabilities	Mean	Standard Deviation	Number of Response
Top management creating vision and strategy drives MI	3.90	0.957	69
Top management sponsorship drives MI	4.28	0.912	68
Top management support and funding is vital for MI	4.38	0.881	68
Top management desire for innovation drives MI	4.14	0.791	69
Risk taking enables initiation of MI	4.01	0.915	69
Change agent or sponsor representative drives MI	3.83	0.923	69
Commitment for business transformation drives MI	4.07	0.896	69

The table shows that top management support and funding is the most important capability ($M = 4.38$, $SD = 0.88$), followed by top management sponsorship ($M = 4.28$, $SD = 0.91$) and top management desire for innovation ($M = 4.14$, $SD = 0.79$). Change agent and vision and strategy are seen as less important to drive management innovation in large rail service organisations.

The correlation matrix in Table 5.24 shows that there are positive correlations amongst all the driving capabilities.

Table 5.24: Correlation matrix – Driving capabilities

	Top management creating vision and strategy drives MI	Top management sponsorship drives MI	Top management support and funding is vital for MI	Top management desire for innovation drives MI	Risk taking enables initiation of MI	Change agent or sponsor representative drives MI	Commitment for business transformation drives MI
Top management creating vision and strategy drives MI	1.000	.410	0.218	.378	0.096	.331	0.209
Top management sponsorship drives MI		1.000	.591	.555	0.183	.366	0.113
Top management support and funding is vital for MI			1.000	.487	.282	.358	0.081
Top management desire for innovation drives MI				1.000	.272	.400	0.157
Risk taking enables initiation of MI					1.000	.346	.463
Change agent or sponsor representative drives MI						1.000	.367
Commitment for business transformation drives MI							1.000

Table 5.24 shows that a moderate correlation exists between top management sponsorship, funding and support, and desire for innovation. Commitment to business transformation and taking risks also have a moderate correlation. Some of the capabilities have very weak correlations including vision and risk, sponsorship and risk, business transformation with sponsorship, support and funding and desire for innovation. While all the capabilities have positive correlations, some are more important than others, and the need to adopt an appropriate capability depends on the organisational situation and the consequence of not addressing an issue or big opportunities.

5.6.1.3 Developing capabilities

Hypothesis 3: Process, resources, facilitation and idea generation enable the invention of a management innovation.

The literature review and the qualitative case studies highlighted some of the important capabilities that can assist the development of management innovation including innovation process, working group, facilitation, idea generation, stakeholder collaboration, filtering and shaping ideas. Figure 5.5 shows the survey responses.

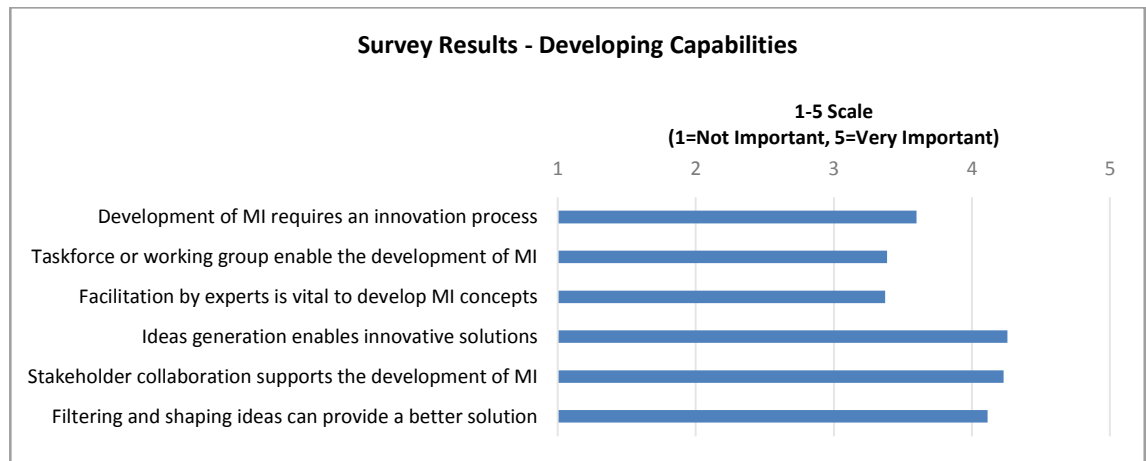


Figure 5.4: Survey Results of Developing Capabilities for MI

Table 5.25: Descriptive analysis – Developing capabilities

Developing Capabilities	Mean	Standard Deviation	Number of Response
Development of MI requires an innovation process	3.60	1.172	70
Taskforce or working group enables the development of MI	3.39	1.146	70
Facilitation by experts is vital to develop MI concepts	3.37	1.092	70
Ideas generation enables innovative solutions	4.26	0.755	70
Stakeholder collaboration supports the development of MI	4.23	0.641	70
Filtering and shaping ideas can provide a better solution	4.11	0.808	70

The table 5.25 shows that all the developing capabilities are important. Idea generation is the most important capability ($M = 4.26$, $SD = 0.76$) followed by

stakeholder collaboration ($M = 4.23, SD = 0.64$), and shaping the ideas to solution is also equally important ($M = 4.11, SD = 0.81$). The least important driver is the innovation process ($M = 3.60, SD = 1.17$).

The correlation matrix in Table 5.26 shows there are positive correlations amongst all the developing MI capabilities.

Table 5.26: Correlation matrix – Developing capabilities

	Development of MI requires an innovation process	Taskforce or working group enables the development of MI	Facilitation by experts is vital to develop MI concepts	Ideas generation enables innovative solutions	Stakeholder collaboration supports the development of MI	Filtering and shaping ideas can provide a better solution
Development of MI requires an innovation process	1.000	.307	.259	0.081	0.159	.400
Taskforce or working group enables the development of MI		1.000	.428	0.202	.274	0.136
Facilitation by experts is vital to develop MI concepts			1.000	0.179	0.092	0.040
Ideas generation enables innovative solutions				1.000	.284	0.070
Stakeholder collaboration supports the development of MI					1.000	.251
Filtering and shaping ideas can provide a better solution						1.000

While all the capabilities have positive correlations, some are more important than others. There are two moderate correlations between the management innovation process and shaping ideas and workforce and facilitation. This indicates that the process should cover filtering and shaping ideas to solution and a taskforce or working group formed to generate ideas needs to be facilitated. There are a few weak correlations including innovation process and idea generation and stakeholder collaboration; working group and shaping ideas; facilitation and idea generation and

stakeholder collaboration.

5.6.1.4 Deploying capabilities

Hypothesis 4: Staff motivation, consultation, communication and the environment enable the deployment of management innovation.

The literature review and the qualitative case studies highlighted some of the important capabilities that can assist diffusion of management innovation including staff motivation, engaging staff, union, top management communication, changing mindset, and changing environment. Figure 5.6 shows the survey responses.

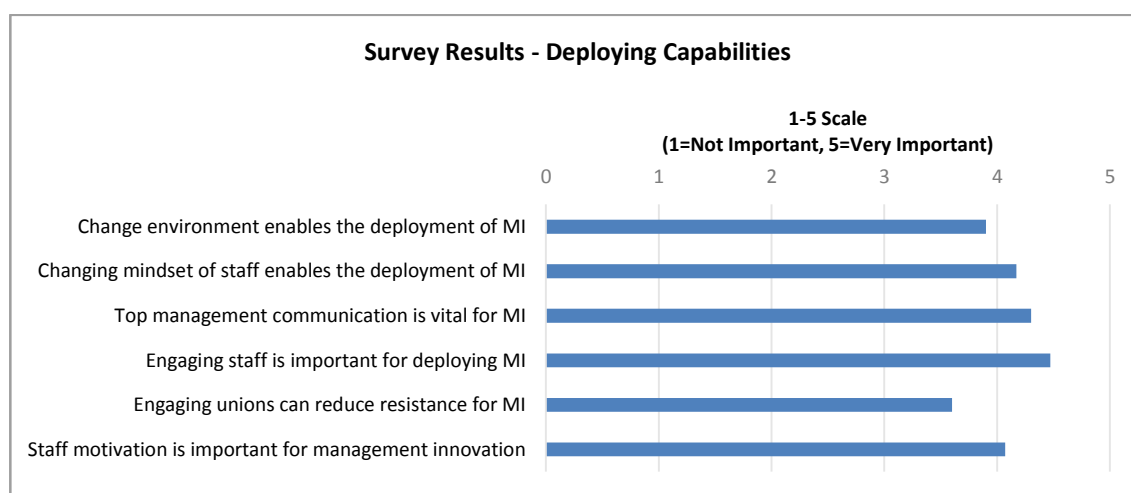


Figure 5.5: Survey Results of Deploying Capabilities for MI

Table 5.27: Descriptive analysis – Deploying capabilities

Deploying Capabilities	Mean	Standard Deviation	Number of Response
Change environment enables the deployment of MI	3.90	0.903	70
Change mindset of staff enables the deployment of MI	4.17	0.816	70
Top management communication is vital for MI	4.30	0.805	70
Engaging staff is important for deploying MI	4.47	0.583	70
Engaging unions can reduce resistance for MI	3.60	0.999	70
Staff motivation is important for management innovation	4.07	0.857	70

The table 5.27 shows that all the deploying capabilities are almost equally important, engaging staff is the most important capability ($M = 4.47, SD = 0.58$) followed by top management communication ($M = 4.30, SD = 0.80$). Change mindset ($M = 4.17, SD = 0.82$) and motivation ($M = 4.07, SD = 0.86$) seem to be equally important to diffuse management innovation.

Table 5.28: Correlation matrix – Deploying capabilities

	Change environment enables the deployment of MI	Changing mindset of staff enables the deployment of MI	Top management communication is vital for MI	Engaging staff is important for deploying MI	Engaging unions can reduce resistance for MI	Staff motivation is important for management innovation
Change environment enables the deployment of MI	1.000	.523	.372	0.190	.433	.306
Changing mindset of staff enables the deployment of MI		1.000	.362	0.218	.291	0.136
Top management communication is vital for MI			1.000	.241	0.200	0.234
Engaging staff is important for deploying MI				1.000	.357	.445
Engaging unions can reduce resistance for MI					1.000	.341
Staff motivation is important for management innovation						1.000

Table 5.28 shows that there are three moderate correlations between change environment and people mindset; and also between engaging staff and staff motivation. It is interesting to note that change environment and staff engagement, change mindset and staff motivation shows weak correlations.

5.6.1.5 Diffusing capabilities

Hypothesis 5: The outcome of management innovation benefits organisations.

There are two possible outcomes as a result of implementing management innovation. The first outcome is achieving the intent of why the management innovation was initiated in the first place. For example, in the third case study, the customer service model was initiated to improve customer satisfaction, and customer satisfaction increased from 79% to 90% within three years.

The second outcome is a new management innovation process is invented, which can be used for other situations. For example, in the first case study, a new management innovation process was developed for eliminating level crossing incidents and the same process was used for improving track safety.

In order to manage the diffusing and deploying of the outcome, program and governance are important. This includes project and portfolio management. Figure 5.7 shows the survey responses on diffusion capabilities.

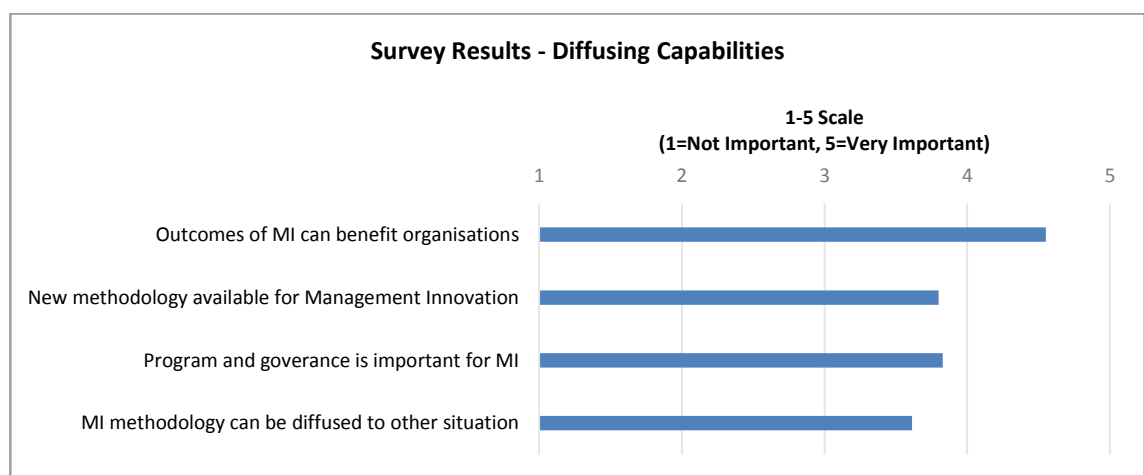


Figure 5.6: Survey Results of Diffusion Capabilities for MI

Table 5.29: Descriptive analysis – Diffusing capabilities

Diffusing Capabilities	Mean	Standard Deviation	Number of Response
Outcomes of MI can benefit organisations	4.55	0.697	69
New methodology available for management innovation	3.80	0.754	70
Program and governance is important for MI	3.83	0.978	70
MI methodology can be diffused to another situation	3.61	0.873	70

Table 5.29 shows that all the capabilities are important, the outcome of management innovation benefitting the organisation is the most important capability ($M = 4.55$, $SD = 0.70$) and the rest of the capabilities are as important as each other.

Table 5.30: Correlation matrix – Diffusing capabilities

	Outcomes of MI can benefit organisations	New methodology available for management Innovation	Program and governance is important for MI	MI methodology can be diffused to another situation
Outcomes of MI can benefit organisations	1.000	.361	.304	0.235
New methodology available for management Innovation		1.000	.506	.295
Program and governance is important for MI			1.000	.371
MI methodology can be diffused to another situation				1.000

Table 5.30 shows that new methodology to diffuse and program and governance have moderate correlations. All other correlations are weak and almost equal.

5.6.2 Confirmatory factor analysis

Confirmatory factor analysis is a statistical technique used to verify the factor structure of a set of observed variables (Suhr 2006). Literature review and qualitative research data from three case studies from the three participating organisations enabled to explore the various capabilities that are aligned with five stages of management innovation framework. In order to test the variable model fit in each stage, a survey research was conducted from the three organisations who participated in case study

research, data collected from the survey research is used to analyse the model fit for each stage of management innovation using AMOS, an analytical software package integrated with SPSS (Statistical Package for Social Sciences) software package.

To evaluate the model, common fit model measures were applied including, the fit index ratio χ^2 , degrees of freedom (df), Mean Square Error of Approximation (RMSEA); Comparative Fit Index (CFI), Goodness-of-Fit statistic, (GFI), Incremental Fit Indices (NFI), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI).

Comparative Fit Index (CFI), greater than 0.90 is considered an adequate model fit (Lance, Butts & Michels 2006). The GFI, TLI, CFI, compare a hypothesis model to a baseline model to see how well a model fits. The model fit index close to 1 (0.95) indicates a very good fit (Lue et al. 2015). The fit index, acceptable threshold levels and description of tests are shown in Table 5.31 below.

Table 5.31: Fit indices and acceptable threshold levels

Fit index	Acceptable threshold levels	Description
Absolute Fit Indices Chi-Square χ^2	p value ($p > 0.05$)	Chi square is used to determine how closely the observed data fit with expected data
Root Mean Square Error of Approximation (RMSEA)	Values less than 0.07 (Steiger 2007)	Has a known distribution. Favours parsimony. Values less than 0.03 represent excellent fit.
Goodness-of-Fit statistic (GFI)	Values greater than 0.95 Very good model fit (Lue et al. 2015).	Scaled between 0 and 1, with higher values indicating better model fit. This statistic should be used with caution.
Incremental Fit Indices (NFI)	Values greater than 0.95 Very good model fit (Lue et al. 2015).	Assesses fit relative to a baseline model which assumes no covariances between the observed variables. Has a tendency to overestimate fit in small samples.
Tucker-Lewis Index (TLI)	Values greater than 0.95 Very good model fit (Lue et al. 2015).	Non-normed, values can fall outside the 0-1 range. Favours parsimony. Performs well in simulation studies (McDonald & Marsh 1990; Sharma et al. 2005)
Comparative Fit Index (CFI)	Values greater than 0.95 Very good model fit (Lance et al. 2006).	Normed, 0-1 range.

Source: (Hooper, Coughlan & Mullen 2008)

Data collected through the survey for discovering, driving, development, deployment and diffusing capabilities are analysed using structural equation modelling and results are discussed below. The Management Innovation Capability Framework is the final framework with five set of capabilities discussed below.

5.6.2.1 *Discovering capabilities*

The discovering capabilities has eight discovering capabilities identified from the literature review and three case studies; sensing the need to improve service quality drives management innovation, understanding customer expectations drives management innovation, sensing the need to improve customer satisfaction drives management innovation, sensing technology need drives management innovation, entrepreneurial alertness drives management innovation, sensing opportunity for cost reduction drives management innovation, sensing business growth drives management innovation, sensing threat of losing business drives management innovation. Survey research was used to collect data to further test the model fit and regression of these capabilities within the framework, using structural equation modelling.

The framework model with the eight discovering capabilities demonstrated a good fit based on $\chi^2=24.04$, $n=70$ (number of responses), $df=20$, $CMIN/DF=24.045$, $P=0.240$, $GFI=0.912$, $IFI=0.960$, $TLI=0.915$, $CFI=0.953$, $RMR=0.054$ and $RMSEA=0.054$.

The Goodness-of-Fit statistic and Tucker-Lewis Index are not greater than 0.95 however both measurements are closer to the threshold limit. Comparative Fit Index and Incremental Fit Indices are greater than 0.95. The Comparative Fit Index (CFI) ranges from 0 to 1 with a large value indicating better model fit. Acceptable model fit is indicated by a CFI value of 0.90 or greater (Hu & Bentler 1999). The model has CFI of 0.956 indicating a good fit. Root Mean Square Error of Approximation (RMSEA) is

related to the residual in the model. Acceptable model fit is indicated by an RMSEA value of 0.06 or less. The model has RMSEA of 0.031 that is below 0.06.

The discovering capability model is shown in Figure 5.7 below.

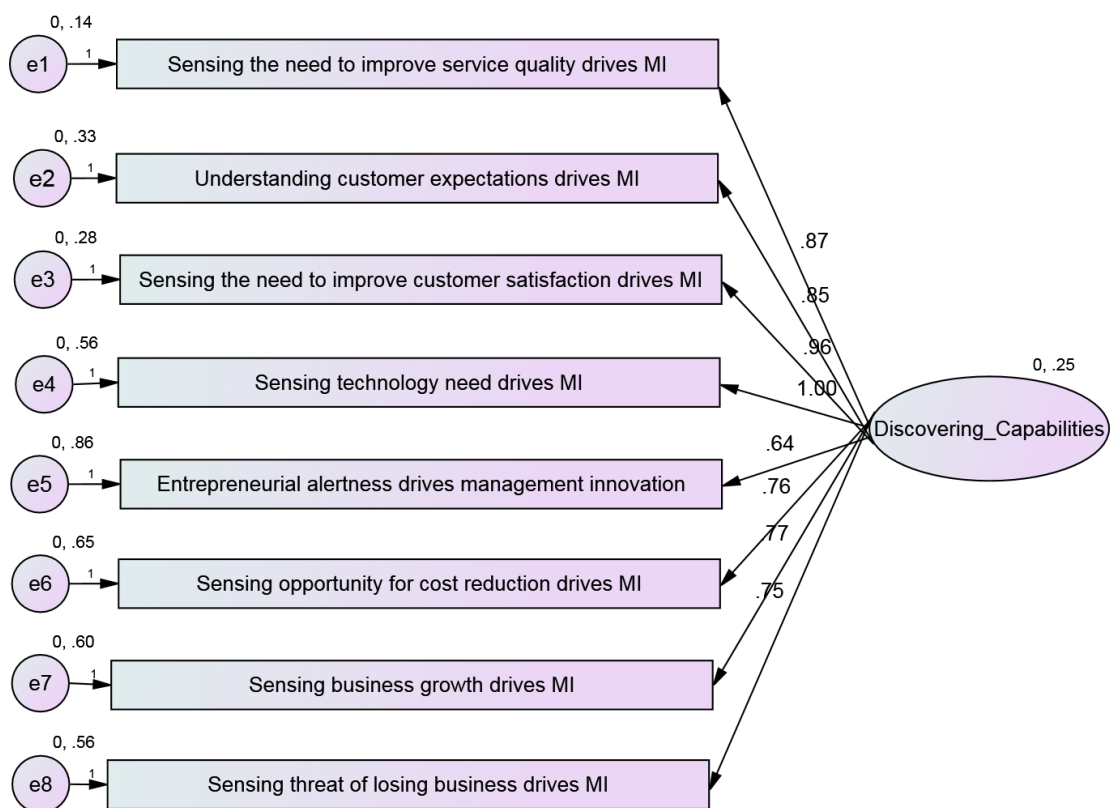


Figure 5.7: Confirmatory factor analysis – Discovering capabilities

Regression test results are shown in Table 5.32 below.

Table 5.32: Regression test results – Discovering capabilities

Discovering Capabilities	Estimate	S.E.	C.R	P
Sensing the need to improve service quality drives MI	.874	.215	4.072	***
Understanding customer expectations drives MI	.847	.236	3.594	***
Sensing the need to improve customer satisfaction drives MI	.964	.250	3.850	***
Sensing technology need drives MI	1.000			
Entrepreneurial alertness drives management innovation	.638	.283	2.258	.024
Sensing opportunity for cost reduction drives MI	.759	.268	2.830	.005
Sensing business growth drives MI	.772	.262	2.946	.003
Sensing threat of losing business drives MI	.748	.256	2.928	.003

The 'p' value is the measure of statistical significance of the probability of a given model when the null hypothesis is true. The cut-off 'p' value is highly significant at $p \leq 0.01$, marginally significant at $p \leq 0.05$ and not statistically significant at $p > 0.10$ (Gelman et al. 2014).

The 'P' value in the above table indicate that the model is highly significant as most of the measures are less than 0.01, three asterisks (***) indicate significance smaller than 0.001. Therefore the capabilities within discovering stage are statistically highly significant.

5.6.2.2 Driving capabilities

There are seven driving capabilities in the Management Innovation Capability Framework identified from the literature review and three case studies: top management creating vision and strategy drives management innovation, top management sponsorship drives management innovation, top management support and funding is vital for management innovation, top management desire for innovation drives management innovation, risk taking enables initiation of management innovation, change agent or sponsor representative drives management innovation, commitment for business transformation drives management innovation. Survey research was used to collect data to further test the model fit and regression of these driving capabilities within the framework, using structural equation modelling.

Confirmatory factor analysis was used to test the factor structure of observed variables. The confirmatory data model for driving capabilities was developed on seven variables. The model did not show a good fit with $\chi^2=3.43$, $n=70$, $df=5$, $CMIN/DF=32.55$, $P<0.003$, $TLI=0.649$, $CFI=0.824$ and $RMSEA=0.139$. The TLI and CFI values are very low compared to the threshold values. The variables of top management sponsorship drives management innovation and risk taking enables initiation of management innovation contributed to the misfit.

Top management commitment can be removed as this capability is similar to management support and funding. Only participants from the level crossing case study organisation commented on taking risk for innovation, while the other two organisations did not discuss risk taking. Therefore these two capabilities can be removed from the model.

As a result, the revised model with five variables loaded demonstrated much better fit: $\chi^2=1.824$, $n=70$, $df=2$, $CMIN=3.437$, $P=0.633$, $GFI=0.982$, $IFI=0.958$, $TLI=0.901$, $CFI=0.951$ and $RMSEA=0.065$.

Root Mean Square Error of Approximation (RMSEA) is just above the preferable range, however all other results indicate that this model is a good fit based on the other results. The driving capabilities are presented in Figure 5.8 below.

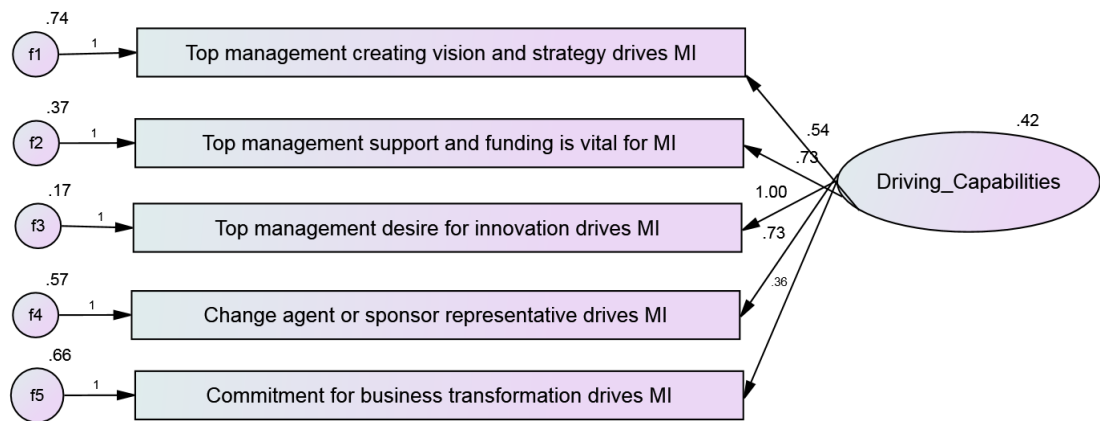


Figure 5.8: Confirmatory factor analysis – Driving capabilities

Regression test results are shown in Table 5.33 below.

Table 5.33: Regression test results – Driving capabilities

Regression test – Driving capabilities	Estimate	S.E.	C.R.	P
Top management creating vision and strategy drives MI	.539	.223	2.415	.016
Top management support and funding is vital for MI	.726	.275	2.644	.008
Top management desire for innovation drives MI	1.000			
Change agent or sponsor representative drives MI	.731	.258	2.837	.005
Commitment for business transformation drives MI	.358	.204	1.752	.080

The table for driving capabilities indicates that the ‘p’ value is less than 0.01 for two variables and just above 0.01 for one variable and only one variable exceeded 0.05, still less than 0.1. Therefore the capabilities within driving stage are statistically in between highly and marginally significant.

5.6.2.3 Developing capabilities

There are six developing capabilities in the Management Innovation Capability Framework identified from the literature review and three case studies: development of management innovation requires an innovation process, taskforce or working group enables the development of management innovation, facilitation by experts is vital to

develop management innovation concepts, ideas generation enables innovative solutions, stakeholder collaboration supports the development of management innovation, and filtering and shaping ideas can provide a better solution. Survey research was used to collect data to further test the model fit and regression of these development capabilities within the framework, using structural equation modelling.

Confirmatory factor analysis was used to test the factor structure of observed variables. The confirmatory data model for development capabilities was developed on six variables. However, the model did not show a good fit, with $\chi^2=7.87$, $n=70$, $df=5$, $CMIN =7.818$, $P=0.167$, $IFI=0.911$, $TLI=0.789$, $CFI=0.894$ and $RMSEA=0.09$. The variable, facilitation contributed to this misfit. As a result, this variable was removed from the model. The revised model with five variables demonstrated much better fit. The development capabilities are presented in Figure 5.9 below.

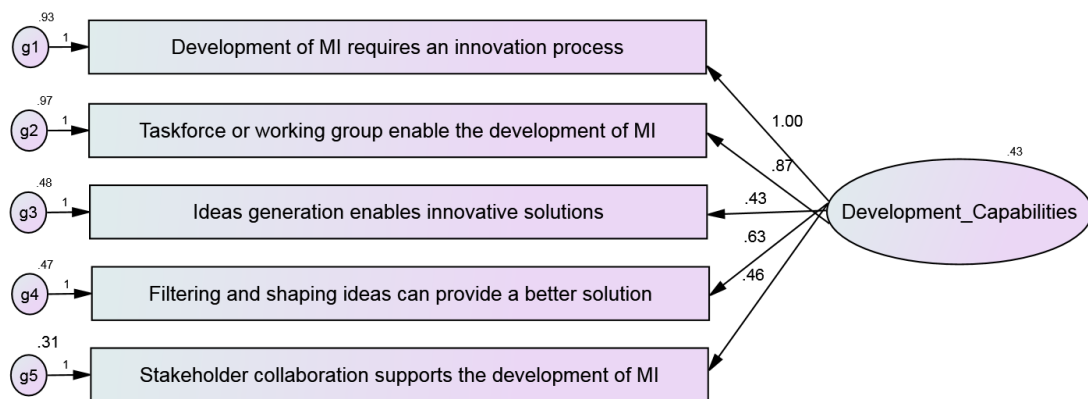


Figure 5.9: Confirmatory factor analysis – Developing capabilities

Although the model demonstrates best fit with five variables instead of six variables, facilitation is not supported in this model, however comments from all three case studies support facilitation. For instance, 12 out of 13 participants in the level crossing case study, all 12 participants in the Centre of Excellence case study and 10 out of 11 participants in the customer service model case study supported facilitation. Therefore

is it important not to remove facilitation capability in the final model.

Regression test results are shown in Table 5.34 below.

Table 5.34: Regression test results – Developing capabilities

Regression test – Developing capabilities	Estimate	S.E.	C.R.	P
Development of MI requires an innovation process	1.000			
Taskforce or working group enables the development of MI	.868	.356	2.438	.015
Ideas generation enables innovative solutions	.430	.209	2.064	.039
Filtering and shaping ideas can provide a better solution	.631	.256	2.468	.014
Stakeholder collaboration supports the development of MI	.463	.194	2.385	.017

The table for developing capabilities indicates that all ‘p’ values are just above 0.01 and less than 0.05. Therefore the capabilities within developing stage are statistically in between highly and marginally significant.

5.6.2.4 Deploying capabilities

There are six deployment capabilities in the Management Innovation Capability Framework identified from the literature review and three case studies: change environment enables the deployment of management innovation, change mindset of staff enables the deployment of management innovation, top management communication is vital for management innovation, engaging staff is important for deploying management innovation, engaging unions can reduce resistance for management innovation, and staff motivation is important for management innovation. Survey research was used to collect data to further test the model fit and regression of these deploying capabilities in the framework, using structural equation modelling.

However, the model did not show a good fit, with $\chi^2=27.604$, $n=70$, $df=9$, $CMIN/DF=27.604$, $P=0.001$, $IFI=0.791$, $TLI=0.626$, $CFI=0.775$ and $RMSEA=0.173$. The

variable staff engagement contributed to this misfit and was removed from the model. The revised model with five variables demonstrated much better fit with $\chi^2=6.230$, $n=70$, $df=2$, $CMIN/DF=6.230$, $P=0.284$, $GFI=0.966$, $IFI=0.982$, $TLI=0.961$ and $CFI=0.980$, $RMSEA=0.060$. The deployment capabilities are presented in Figure 5.10 below.

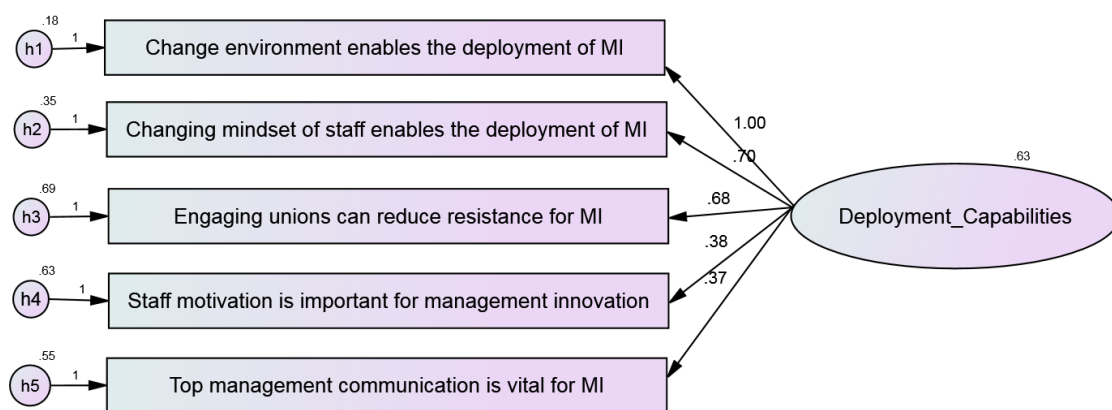


Figure 5.10: Confirmatory factor analysis – Deploying capabilities

Regression test results are shown in the table 5.35 below.

Table 5.35: Regression test results – Deployment capabilities

Regression test – Deploying capabilities	Estimate	S.E.	C.R.	P
Change environment enables the deployment of MI	1.000			
Changing mindset of staff enables the deployment of MI	.703	.151	4.654	***
Engaging unions can reduce resistance for MI	.681	.172	3.954	***
Staff motivation is important for management innovation	.378	.143	2.638	.008
Top management communication is vital for MI	.374	.135	2.772	.006

The 'P' values in the above table indicate that the model is highly significant as all of the measures are less than 0.01, three asterisks (***) indicate smaller than 0.001. Therefore the capabilities within deploying stage are statistically highly significant.

Although the model demonstrates best fit without the capability of staff engagement half of all the participants (18 out of 36) commented about staff engagement. Without

engaging the staff, deploying management innovation may not be effective, therefore this capability is retained in the final model.

5.6.2.5 Diffusing capabilities

There are four diffusing capabilities in the Management Innovation Capability Framework identified from the literature review and three case studies: outcomes of management innovation can benefit organisations, new methodology available for management innovation, program and governance is important for management innovation, and management innovation methodology can be diffused to another situation. Survey research was used to collect data to further test the model fit and regression of these diffusion capabilities in the framework, using structural equation modelling.

The variables demonstrated a good fit with $\chi^2 = 2.236$, $n=70$, $df=2$, $CMIN/DF=1.118$, $P=0.327$, $GFI=0.981$, $IFI=0.989$, $TLI=0.958$, $CFI=0.986$ and $RMSEA = 0.041$. The deployment capabilities are presented in Figure 5.11 below.

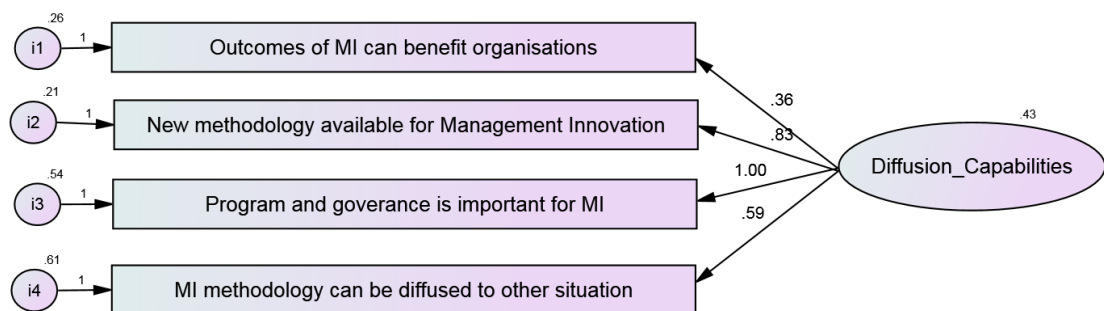


Figure 5.11: Confirmatory factor analysis – Diffusing capabilities

Regression test results are shown in Table 5.37 below.

Table 5.36: Regression test results – Diffusion capabilities

Regression test – Diffusing capabilities	Estimate	S.E.	C.R.	P
Outcomes of MI can benefit organisations	.359	.158	2.276	.023
New methodology available for management innovation	.829	.278	2.981	.003
Program and governance is important for MI	1.000			
MI methodology can be diffused to other situations	.587	.197	2.985	.003

The 'P' values in the above table indicate that the model is highly significant as two of the measures are less than 0.01, and one measure is just above 0.01. Therefore the capabilities within diffusing stage are statistically highly significant.

5.7 Chapter summary

Quantitative analysis was undertaken to validate the findings from the qualitative case studies using descriptive analysis and confirmatory factor analysis. The descriptive analysis showed that all capabilities positively support the discovering, driving, developing, deploying and diffusing capabilities. Some capabilities correlate more strongly than others, while some are very weak correlations. Management innovation is dependent on the reason for its initiation and the consequences of not addressing any opportunities or threats. The results show that none of the capabilities are negatively correlated or have significant gaps from each other. Table 5.39 summarises the capabilities.

Table 5.37: Summary of capabilities after validation

Capability stages	Enabling capabilities
Discovering capabilities	<ul style="list-style-type: none"> Sensing the need to improve service quality Sensing the need to meet customer needs Sensing the need for improve customer satisfaction Sensing the need for technology Sensing the need for entrepreneurial alertness Sensing the need to reduce cost Sensing the need for business growth Sensing the business threats
Driving capabilities	<ul style="list-style-type: none"> Vision and strategy Top management support and funding Top management desire for radical outcome Appointing sponsor representative Commitment for business transformation
Developing capabilities	<ul style="list-style-type: none"> Management innovation process Working group Facilitation Generating ideas Key stakeholder collaboration Shaping ideas to solution
Deploying capabilities	<ul style="list-style-type: none"> Change environment Change mindset Top management communication Engaging union Staff motivation
Diffusing capabilities	<ul style="list-style-type: none"> Management innovation outcome benefits New management innovation methodology Program and governance Diffusion of management innovation to other situations

The next chapter presents the validated Management Innovation Capability Framework model and discusses the findings in relation to the literature, contributions and limitations.

6 Discussion and Conclusion

6.1 Introduction

This chapter provides an overview of the research, discuss key findings, presents the final Management Innovation Capability Framework, discusses the theoretical contribution of this thesis to management innovation research, considers the practical implications and summarises the limitations of this research and avenues for potential future research. Figure 6.1 shows the structure of the chapter.

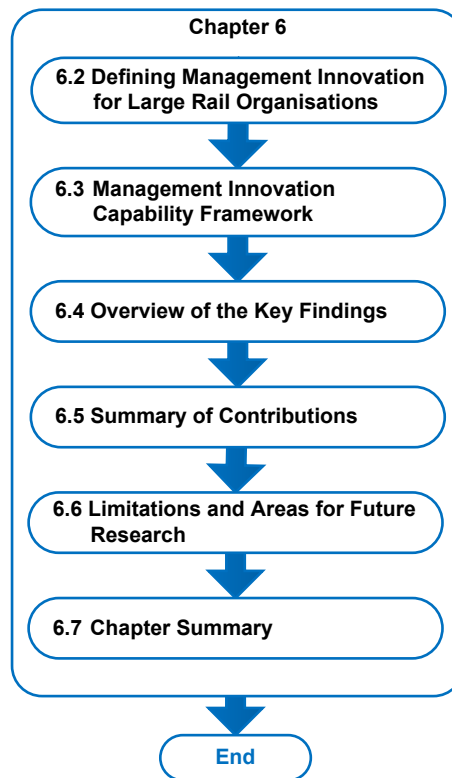


Figure 6.1: Outline of Chapter 6

The research aimed to identify capabilities for management innovation in large rail organisations and how these can be aligned to a useful framework. Therefore, this chapter is structured around the key arguments developed within this thesis to answer the research question of how to build management innovation capabilities in large rail organisations and compares the results of the three case studies and surveys

conducted with key stakeholders to the literature discussed in the previous chapters and also discusses the research contribution and limitations.

Management innovation is an addition to the innovation typology that was introduced in a conceptual paper by Birkinshaw, Hamal, et al. (2008) and has subsequently attracted the attention of management researchers and scholars.

This research contributes to the theoretical knowledge and practical application of management innovation by focusing on three areas:

- 1) defining what management innovation means to large rail organisations
- 2) identifying the capabilities that enable a large rail organisation to adopt and use management innovation
- 3) determining how these capabilities can be aligned into a framework that is understood and used in the rail industry.

The aim of this research is not to determine which is the most important capability in each stage of management innovation, but to demonstrate that management innovation requires multiple enabling capabilities to positively initiate, develop and implement a management innovation. Capabilities are discussed in relation to various management theories, to identify and distil the right capabilities for the right stage of management innovation.

6.2 Defining management innovation for large rail organisations

Management innovation is defined as a significant shift in the current management practices, process or structure. Birkinshaw, Hamel, et al. (2008, p. 829)'s original

definition of management innovation is ‘the generation and implementation of a management practice, process, structure or, technique that is new to the state of the art and is intended to further organisational goals’.

Examples discussed in management innovation literature such as Total Quality Management, Just-In-Time and Balanced Scorecard (Birkinshaw, Hamal, et al. 2008) are decades old. However, what is not explicit in the literature is the commercial interest of organisations to promote the use of these kinds of management innovation worldwide. Promoting management innovation is not their core business. For example, Toyota’s interest is making and selling cars, rather than promoting a management innovation such as ‘Just-in-Time’. Management innovations can be understood as best practice and adopted by many organisations, promoted through management advisors and consultants. Similarly rail organisations have their core business of operating rail services and the commercialisation of management innovation or state-of-the-art management innovation may not be appropriate to the rail organisation. Based on the literature review and the empirical research in large rail organisations and public sector, management innovation for large rail organisations can now be defined as:

Creation and implementation of new management models, strategies and principles using a novel approach with a desire to make radical changes and diffuse these to other situations.

Management practices in rail organisations are traditional and inefficient. Top management realises the inefficient management practices and is making significant changes to the management models including sensing opportunities, using technology and mobilising resources effectively. The Management Innovation Capability Framework developed in this research will assist not only rail organisations but also other large public sector organisations as most of the public sector shares similar

characteristics in terms of culture, complex organisational structure and bureaucratic barriers to innovation particularly organisations responsible for the safety of the public where a risk averse culture is dominant.

The final, validated Management Innovation Capability Framework is discussed next.

6.3 Management innovation capability framework

The Management Innovation Capability Framework can be used effectively as a management tool to realise major opportunities and to resolve significant problems in large organisations.

For exploration purposes, based on existing innovation process models, a high-level three-stage structure of driving capabilities, developing capabilities and diffusing capabilities was proposed initially. However, the findings indicate that driving capabilities include two distinct types of capabilities. The first is what is driving executives (top management) to look for a management innovation, and the second driver is how executives drive the management innovation forward in a large organisation. Similarly, diffusing capabilities also refer to two set of capabilities: the first is the deploying management innovation outcome, and the second is diffusing the same methodology for a management innovation to other situations. Therefore, the capabilities for building management innovation in large organisations can be aligned into five groupings of capabilities: **discovering capabilities, driving capabilities, developing capabilities, deploying capabilities and diffusion capabilities**. The revised Management Innovation Capability Framework is shown in Figure 6.2 below.

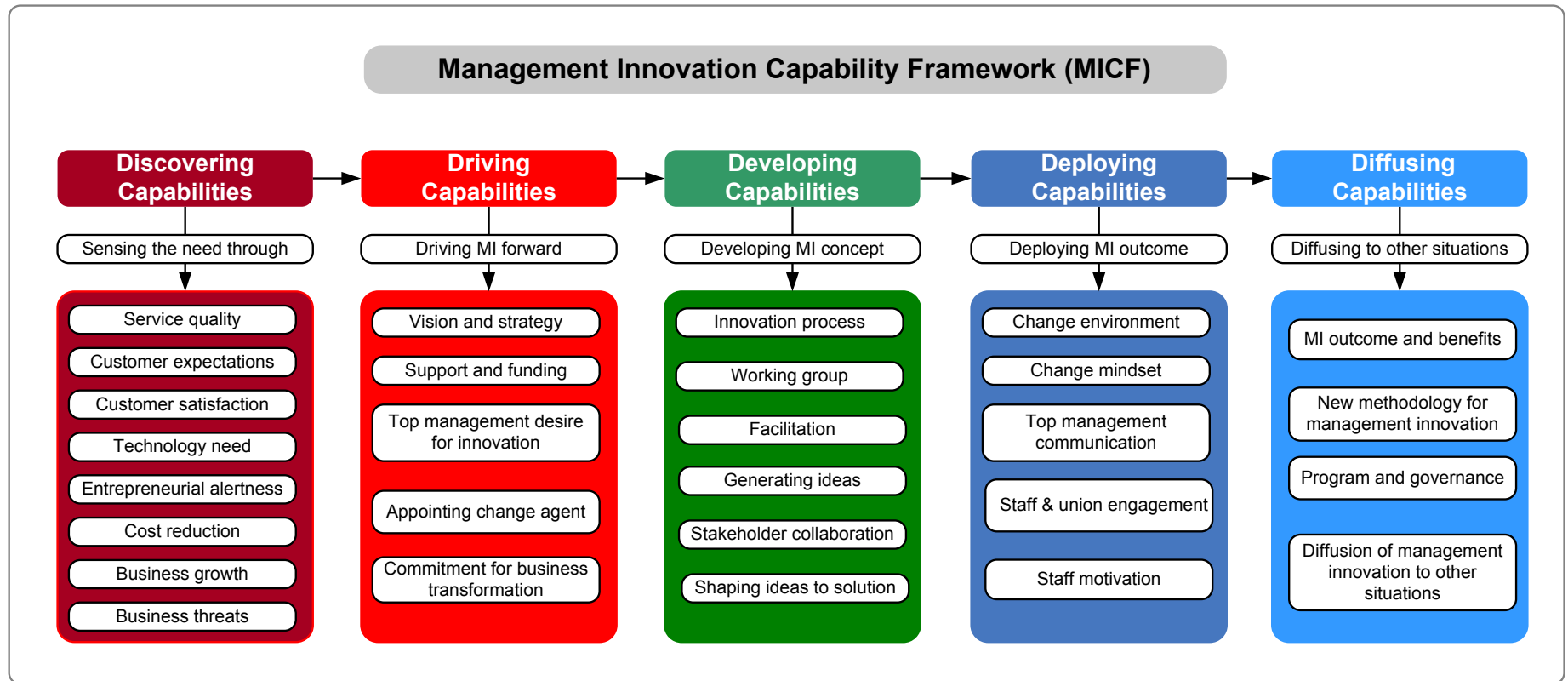


Figure 6.2: Management Innovation Capability Framework

The five capabilities and their enablers are discussed next and compared with the literature.

6.3.1 Discovering capabilities

A successful management innovation initially requires top management to sense the need for management innovation. Sensing the need is discussed in entrepreneurial and dynamic capability theories. For example, Shane (2003) notes that individuals with entrepreneurial capability sense opportunities by scanning markets, technology and customer needs; and Neck & Manz (1996) suggest that entrepreneurs determine business opportunities for creating and delivering stakeholder value.

Similarly, Kor et al. (2007b) claim that 'entrepreneurial sense dimension' relates to envisioning or seeing technological and market opportunities, and also sensing threats. Managers who participated in the case study and survey research strongly supported that sensing a technological gap can enable seeing the ineffective processes and opportunity to deliver effective services and quick and accurate information. Use of technology can change how human capabilities are used in organisations.

Dynamic capability also enables executives and managers to discover opportunities by sensing the organisational needs and gaps. The dynamic capability model has been defined as sensing and shaping opportunity (Teece 2007a). In expanding on this definition, Zahra et al. (2006) argue that dynamic capabilities assist to determine new sources for competitive advantages. Likewise, some research suggests that dynamic capabilities could efficiently generate and sustain competitive advantages in an organisation (Rindova & Kotha 2001b), while others have noted that dynamic capability empowers managers to influence innovative performance (Collis & Montgomery 1995). It is clear that entrepreneurship and dynamic capability are

prerequisites for sensing opportunities and creating competitive advantage, but the specific capabilities that enable large rail organisations to sense opportunities are not obvious in the previous research.

Sensing threats can also enable organisations to discover opportunities. This is supported by Rindova & Kotha (2001a) who observed that dynamic capabilities have the capacity to shape and sense threats and opportunities, to seize opportunities and to sustain competitiveness. In addition, Winter (2003) argues that dynamic capabilities can become operational capability if radical change was seen as potential.

In addition to these capabilities, other capabilities discussed in the case studies included entrepreneurial alertness. According to Yu (2001b) entrepreneurial alertness refers to endeavours to exploit profit opportunities by interpreting incoming information in a different way from the general public. Researchers have emphasised that entrepreneurship and innovation are both necessary to focus on an organisation's people, structure, culture, process and technology and transformation for profit (Avolio et al. 1999).

There is clearly potential for rail organisations to use multiple lenses to take advantage of business opportunities and gaps in organisational processes and performance, taking advantage of technology and being vigilant about the cost and people issues. Roundy et al. (2017) argue that the role of entrepreneurial alertness in more mature organisations has not been explored. Entrepreneurial alertness is looking for long-term benefits (Wang et al. 2006). Participants in the case studies recognised 'business growth' as a capability for management innovation. This is similar to entrepreneurial alertness where managers are required to create strategies and make decisions for competitive advantage and prepare for the potential opportunity for business growth.

From the literature review and the empirical research, a number of capabilities were

identified and constructed into the framework including service quality; customer needs; customer satisfaction; using technology; entrepreneurial alertness; cost reduction and business growth opportunity; and finally sensing the business threats. Dottore (2009) suggests that 'sensing threats and opportunities' are practised in the organisational environment. The sensing capability depends on the organisational situation and impact of not addressing issues, gaps and potential opportunities.

The results of the case studies show that 'customer service quality', 'understanding customer expectations' and 'customer satisfaction' were recognised by the participants. Many researchers have identified customer satisfaction as being the most important success factor of business in many industries such as banking, telecommunications and manufacturing (Berry & Parasuraman 1997; Bolton & Drew 1991; Wang et al. 2004; Wang & Yang 2004).

The rail industry does not operate in a hyper-competitive market such as banking, telecommunications or manufacturing. However, with governments spending billions of dollars annually to install new assets, upgrade existing assets, and maintain and improve customer service levels, and with more of these activities being performed by contractors, rail service providers are starting to view the industry as a competitive market.

The recommendations of the Rail Safety and Standards Board, London (2009) for enhancing customer service encompass several key areas including improving the reliability of service, safety, frequent services, punctuality, quality of journey, cost of tickets, dealing with service disruptions, transport connectivity, signage, cleanliness of trains and the overall satisfaction of customers with their travel. If top management senses the threat of losing business or safety and reputational risk, there are possibilities for seeking novel ideas for radical improvement. The voice of the customer

makes public organisations provide good customer service and the required information (Zamil & Shamot 2011) as providing value to customers increases customer satisfaction (Ming-Horng et al. 2012).

Rail service organisations used to have a market monopoly, being predominantly managed by the government, but the modern market for rail services is open to private organisations or public–private partnership arrangements. Therefore, it is important to sense market competition. Poor performance in a competitive market is an indication of business threats. This situation can influence the need for a management innovation to make a radical change to improve performance.

Discovering the need for management innovation is possible by sensing through various capabilities. However, it is totally dependent on the situation confronting the organisation: How big is the issue or opportunity? How is it relevant to the business strategy and needs? How good is the entrepreneurial alertness of the top manager who can make the decision to make a radical change?

6.3.2 Driving capabilities

Once senior managers discover an opportunity by sensing a need, the next step requires top management commitment to drive the opportunity to the next level through a clear vision and strategy, desire for a radical outcome, support and funding, and appointing a senior manager or general manager as a change agent to transform the business from the current state to the desired state.

According to DeBarro et al. (2015), a vision of innovation strategy needs to be articulated in the method of innovation practice. Leaders create vision to achieve the desired goal (Ross & Gray 1997a). Similarly, Martins (1997) argues that vision can enable the environment for creativity, while Keown et al. (2014) suggest that having a

clear vision and strategy is an enabler for innovation. The emphasis on having a clear vision and strategy is especially pertinent in large rail organisations where staff have different competencies and priorities. Many comments from the case studies insisted on the importance of having strategy and vision to achieve the outcome.

Goal setting and working towards a goal are important in large, complex organisations. The purpose of the management innovation and the goal that senior management would like to achieve must be well understood. Otherwise, if the goal or vision is unclear, it may not be possible to achieve the expected outcome due to the complexity. Bass et al. (2003) claim that transformational leadership motivates employees in attaining organisational goals. The role of vision and strategy is discussed in the next section.

Staff would like to see the passion or desire from top management for innovation, because when managers have passion they are committed, and they can influence the progress of a management innovation by allocating funding and resources, and participating in meetings and workshops where they talk about the importance of the issue and motivate and encourage the team to be involved. Steiber (2014) suggests that leaders must exhibit passion and enthusiasm, and be curious and willing to actively seek out new ideas both internally and externally.

Deschamps (2005) notes that driving management innovation requires a strong commitment, passion and resource capabilities to develop and deploy an innovative solution. D'Amato & Roome (2009) developed a process model of leadership for innovation including direction, alignment and top management commitment. Top management has the ability to greatly influence management innovation (Vaccaro et al. 2012). A strategic leadership style provides top management commitment to support innovation, and make the capabilities available in the organisation (Bossink

2007).

Klein & Sorra (1996) argue that innovation requires active coordination and senior management commitment. Valmohammadi (2016) claim that lack of executive support is the most challenging barrier for customer service innovation. In large rail organisations, top management commitment drives the management innovation forward, and they support it by providing funds and resources. Coen & Maritan (2011) argued that the most significant management support for innovation in a company is the allocation of resources. Other researchers have observed that top management sponsorship in terms of providing time, resources and funds is crucial for the success of innovation (Holahan et al. 2004; Sharma & Yetton 2003; Van de Ven 1986).

Once top management is committed to the management innovation, they appoint a change agent to take the management innovation forward. Birkinshaw, Hamel, et al. (2008) argue that an internal change agent must be appointed to facilitate the management innovation program, while Klein & Sorra (1996) insist on the importance of senior management decision-making and coordination. The internal change agent appoints a facilitator who can run creative workshops. The change agent must provide direction to the facilitator and ensures appropriate methodology is developed to transform the novel idea into a practical solution.

In all three case studies, a vice president or general manager was nominated as the change agent to support, develop and execute the management innovation. The change agent, in cooperation with the sponsoring executive, clearly defines the desired outcome and encourages the use of novel ideas for a radical outcome. The change agent also ensures that adequate funding and resources are available for the development of management innovation as discussed in the next section.

Parlier (2008a) recommended that internal and external change agents could be used

to facilitate internal innovation processes. The change agent acts as a representative for the executive with a delegated authority to develop strategies and appoint resources for the management innovation to ensure that associated change happens. This was articulated in the observation by Teece et al. (1997a) that the internal change agent develops a human resource capability by integrating, building, and reconfiguring internal and external competencies to create capability to respond to a change in the organisation.

In most organisations, sponsorship is the ownership of the initiative, at the executive level, by someone with the power and influence to allocate funds and resources, and to support the initiative from commencement to completion. In most cases, management innovation can result in significant change. Without executive sponsorship, any organisation is less likely to successfully develop and implement the required change.

The next driving capability for management innovation is 'business transformation'. According to Songkhla (2014), CEOs with transformational leadership are associated with innovation culture. Large rail organisations have multiple layers of management and hierarchy controls and complex business processes. This complexity can hinder creativity and innovation and make business transformation difficult. However the Centre of Excellence and customer service model case studies indicate that business transformation is possible when there is a major change in the organisation. Both organisations used the opportunity to introduce innovative culture and changed the business model that transformed the business.

6.3.3 Developing capabilities

Once the opportunity is discovered and supported by top management, then the next

step is to develop the management innovation concept. The capabilities identified in this study included management innovation process, working group, facilitation, generating ideas, key stakeholder collaboration and shaping ideas to solution.

Various leadership theories discuss the importance of process. For example, charismatic leadership focuses on providing a process for innovation (Barczak & Wilemon 1989; Nadler & Tushman 1990), while transformational leadership empowers team members to challenge existing management processes, practices or structures (Avolio et al. 1999). A suitable process is vital for development of the initial idea or a vision to a conceptual model of management innovation that will produce a potential solution or a better outcome.

Mol & Birkinshaw (2006) recommend that management innovation requires a systemic approach encompassing processes and methods. Similarly, Parsons (1991) also recommends that innovation requires a formal program and process. These arguments are supported by the results of all three case studies, where many of the comments recognised having an innovation process is an important capability to develop a management innovation.

According to Mol & Birkinshaw (2006) management innovation process is often overlooked. This was evident in all three case studies, because the focus of the staff involved in each management initiative was on the problem or opportunity at hand, and all the processes and associated capabilities that enable the management innovation were not visible or documented. However, the end-to-end process was documented in the level crossing case study organisation after the event, and this enabled diffusion of the same methodology to other situations. Based on the information provided in the interviews, the researcher documented the process steps for the other two organisations. Process for management innovation observed from all

three case studies shown in Figure 6.3 below.

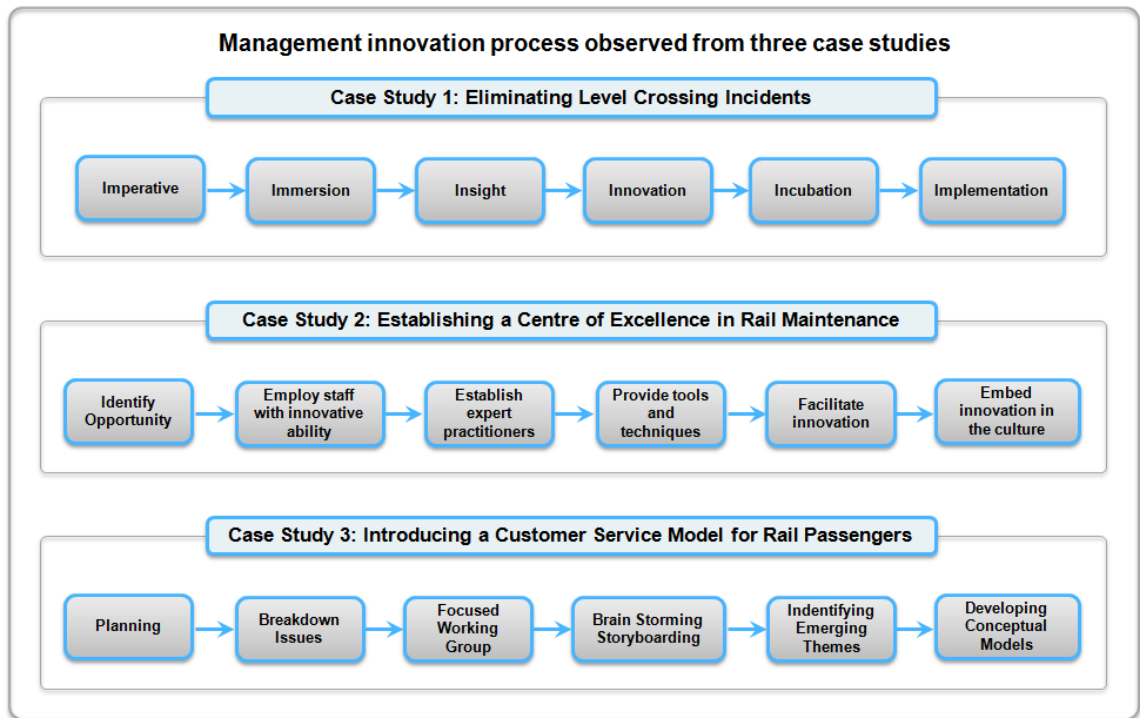


Figure 6.3: Process for management innovation from the three case studies

The development of these processes aligns with the observation by Hamel (2006) that once a management innovation proves to be beneficial for an organisation the process of management innovation becomes part of an ongoing program of invention.

Engaging a small number of staff from all levels of the organisation in a taskforce (or working group) is important for generating ideas and developing solutions for the management innovation. The importance of this capability was acknowledged in many comments from participants in the case studies. This aligns with the concept of drawing resources for organisational needs which is extensively discussed in dynamic capability theory. For example, dynamic capability has been described as bringing internal and external competencies to create capability to respond to the opportunity or to resolve issues (Teece et al. 1997a). Similarly, Jianwen et al. (2009) argue that dynamic capability enables reconfiguring resources to respond to the need for

changing opportunities that enable firms to innovate. Daft (1978) defines dynamic capability as aligning internal and external resources to add value to an organisation.

The three case studies provided further insight into how working groups should be formed. There was strong support for the idea that working groups should be multi-disciplinary and diverse to eliminate group thinking and promote constraint-free thinking. Also, it was suggested that the working group members should be drawn from various levels of the organisation's hierarchy, from senior executives and general managers to frontline staff. Dreu et al. (2006) analysed the methods of team personality diversity and group creativity in management innovation.

Many leadership theories, particularly transformational leadership, suggest that facilitation is one of the key leadership roles for innovation (Friedrich et al. 2009; Nonaka & Kenney 1991b). Fleishman, Mumford, Zaccaro, Levin, Arthur L. Korotkin, et al. (1991) also argue that the leadership for innovation is required to facilitate the various stages of the creative process at multiple levels of an organisation. Transformational leadership motivates employees to attain the organisational goals (Bass et al. 2003), and creates an intellectually stimulating environment (Sosik 1997). Transformational leadership indicates high confidence and expectations in ability of the staff to deliver progressive solutions (Jung et al. 2003).

Once the working group is formed, the change agent and facilitator who run the workshop provide the working group with the context of the issue being addressed, describe the purpose and scope of the initiative, and detail the expected outcome. Birkinshaw, Hamel, et al. (2008) argue that an internal change agent is needed to facilitate and to realise a conceptual idea and transform it into a practical application for management innovation.

Participants in the case studies supported facilitation as one of the important

capabilities for developing management innovation. This aligns with the observation by Bossink (2007) that top management commitment and facilitation of innovation capabilities are the two most important aspects of strategic leadership. Management innovation has the potential to make significant changes in the way organisations operate. Therefore, top management commitment and facilitation are important capabilities.

Once the working group is formed, a process is established and a facilitator is available to commence, the working group is ready for idea generation. Many leadership theories discuss sharing knowledge and particularly the importance of sharing tacit knowledge. For example, Kazemek (1991) suggests that interactive leadership encourages working group participants to share information. Also Lee et al. (2015b) observe that encouraging participants through motivation enables them to share knowledge and ideas for innovation, while Parson (1991) emphasises building capability to generate new ideas to develop new products, and to add value to customers.

To generate new ideas, sharing tacit knowledge is the key to innovation, and knowledge sheds light on creativity, learning and change (Howells 1996; Nonaka & Kenney 1991a). Similarly, Fedor et al. (2003) note that knowledge is considered to be the key ingredient of a company's innovation behaviour, and Zahra & George (2002) posit that the transformation of knowledge reflects the ability of an organisation to consolidate new knowledge with existing knowledge.

The facilitator can use a range of existing 'idea generation' methodologies to encourage the working group to think creatively and generate ideas. This was demonstrated in the range of group exercises and methodologies employed in all three case studies. For example, the first case study collected 3,000 ideas to eliminate

a high-profile safety problem – railway level crossing incidents.

Staff involved in ‘idea generation’ activities for innovation workshops rely on brainstorming exercises and creativity, and do not refer to any explicit knowledge. This aligns with the observation by De Vries et al. (2015) that creativity is involved in the idea generation phase of innovation. However, it was evident from the case studies that some explicit knowledge-gathering had been undertaken to prepare the working group for the workshop, and provide workshop participants with preliminary knowledge to understand the context of management innovation being undertaken. This supports the argument by Howells (1996) and Nonaka & Kenney (1991a) that sharing tacit knowledge is key to innovation.

Nonaka & Takeuchi (1995) discuss the importance of creating ideas specific to a business need. This is particularly true for management innovation where the working group is expected to generate ideas to address a specific business problem or to realise a specific opportunity. Although DeCarolis & Deeds (1999) state that both types of knowledge are important, the empirical evidence indicates that, as argued by Teece et al. (1997b), tacit knowledge is the key type of knowledge required for innovation and creative activity.

The other important capability for developing management innovation is collaboration. Stakeholder collaboration is recognised in the literature as one of the key capabilities for the success of innovation (Agarwal & Selen 2009; Ayuso et al. 2006a). Collaboration for management innovation can happen in a number of ways. Within large organisations this includes collaborating with multiple groups operating in departmental silos, or collaborating with external organisations in the industry and with suppliers, or collaborating through dedicated partnerships or alliances for innovation as suggested by Drucker (1996). However, such partnerships or alliances

were not evident in the case studies.

An important type of collaboration that was evident in the case studies which was not discussed in the literature was collaboration with the sponsor stakeholders. For large rail organisations, it is particularly important to engage the relevant government and transport departments from the beginning to ensure the sponsor stakeholders are aware of the management innovation and the potential change, and that they subsequently provide support in terms of funding approval and managing political implications.

Killen & Hunt (2009) insist that stakeholder collaboration is an important capability for innovation and also note the importance of a strategic alignment of capabilities for a new venture. Any management innovation is a new venture and capable of making significant change to the management principle and philosophy, and will also require significant changes to the operating model. Therefore, the collaboration of key stakeholders is important to achieve the management innovation objectives. This is particularly true for major changes in large rail organisations that may impact internal workplace (industrial) relations or the broader political environment, and represent a significant reputational risk if the management innovation is not designed and handled properly.

Finally, shaping ideas to solution is another important capability for the developing stage. Birkinshaw, Hamel, et al. (2008) suggest that refining the ideas for the organisational need is also important and influences the change. Klein & Convertino (2015) investigated the roadmap for using open innovation systems and suggested an author-based and content-based filtering model as shown in Figure 6.4.

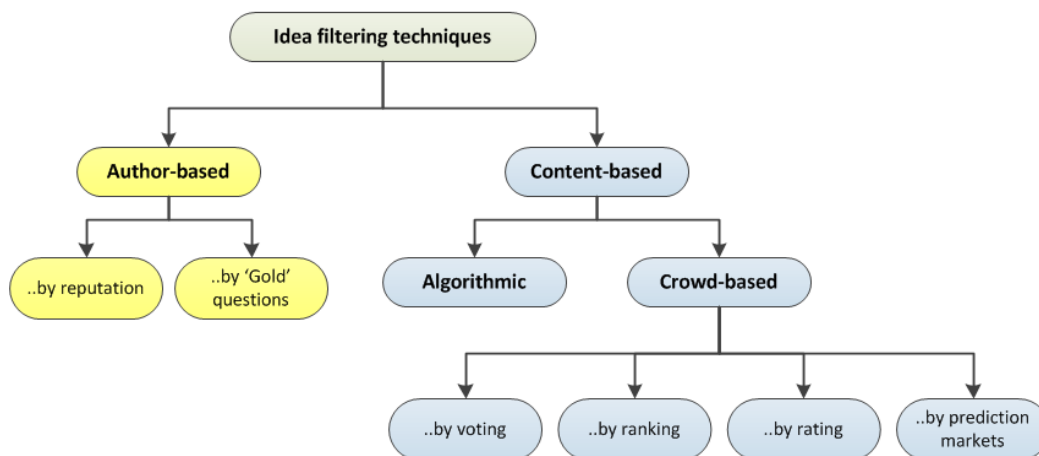


Figure 6.4: Idea filtering techniques

Source (Klein & Convertino 2015)

Author-based filtering techniques filter ideas based on who contributed them. The content-based filtering technique is different from the author-based filtering technique. Voting, rating and ranking are all acceptable techniques of idea filtering (Baez & Convertino 2012).

Once ranking has been performed, an additional round of voting is intended to select the best ideas (Zhang & Zhang 2014). Participants are asked to evaluate these ideas with respect to a multiple customer-defined approach (Slamka et al. 2012). Voting, rating, ranking and the use of prediction markets all play a role in the techniques of idea filtering (Baez & Convertino 2012).

One of the case studies had a unique methodology to filter ideas. After gathering 3,000 ideas to resolve a single but important issue, the following methodology was used to filter the ideas:

- Is it an 'out-of-the-box' idea?
- Is this idea new?
- If the idea is not feasible, it can go forward (as management believed that a not feasible idea may give a breakthrough).

Organisations use multiple methods to evaluate ideas. However, the observation from the level crossing case study indicates that evaluation is used for filtering several ideas rather than one idea. Although filtering ideas is a common technique, a surprise finding in two of the three cases studies is the concept of shaping ideas to a potential solution. This means the filtered ideas are further grouped into a new business model. Instead of just a number of filtered ideas, the outcome of the ideas generation is a conceptual model used to describe the future business model. The customer service model included a diagram to explain the future customer service model. Similarly, in the first case study, the elimination of level crossing incidents included a number of conceptual models to describe and explain this outcome to all levels of the organisation, to the minister, the transport department and to all relevant stakeholders. Therefore, shaping ideas to a conceptual model (or solution) is an important development of management innovation in large rail service organisations.

6.3.4 Deploying capabilities

The deploying stage may involve several initiatives such as changing the organisational structure, updating processes, or introducing new technology to achieve the desired outcome and monitor the benefits. Evidence from the case studies suggests that change environment, change mindset, top management communication, engaging staff and unions, and motivation are the capabilities for deploying management innovation. The survey results confirmed that all of these enabling capabilities are important, and support the deployment of management innovation.

Research on transformational leadership highlights the importance of ‘change environment’ or ‘climate for change’. Creating the right organisational climate is important for implementing a change and transformational leadership establishes the climate for creativity (Kim & Yoon 2015). The right corporate culture and

organisational climate enable a firm to adapt to new situations and challenges, and influence the behaviour of staff (Sheih & Wang 2010).

Expanding on this idea, Panuwatwanich et al. (2008a) have suggested that leadership, along with a sound team climate and organisational culture, provide a combined capability for the deployment of innovation within an organisation. This argument is also supported by the observation by Martins & Martins (2002) that an organisational culture model promotes creativity and management innovation within many organisations.

The organisational context is vital for either facilitating or inhibiting new ideas, and influencing employees' reactions to change, and the organisational climate will influence the adoption of any management innovation (Hsieh 2011). Many researchers support the importance of organisational culture and a transformational climate (or change environment) as an important capability for introducing change, adapting to new situations and influencing management innovation (Birkinshaw, Hamal, et al. 2008; Hamel & Breen 2007a; Hsieh 2011; Rindova & Kotha 2001a; Sheih & Wang 2010).

This climate or environment depends on the situation and timing and other influencing factors. For example, in the case study of eliminating level crossing incidents, the organisation was willing to do something different (or radical) in response to the death of two train drivers and other serious incidents within a short period of time. The situation, the timing and the emotional reactions generated by the incidents created an organisational climate for change. In the second case study, the organisation was presented with the opportunity of a \$200 million investment in a new maintenance facility, the Centre of Excellence, and used this opportunity to recruit new staff and introduce a new operating model. In the third case study, the organisation went

through a major reform which introduced new branding and a new leadership group. The newly established Customer Service Directorate also provided a perfect change platform to introduce a new customer service model. Thus, management innovation can leverage a major issue or reform or opportunity to deploy a new management model, practices or philosophy. This approach will also minimise resistance, and help to justify the reason for change.

Observations from all three case studies demonstrate that, in each of the large rail organisations, a 'change environment' supported the development and deployment of management innovation. The change climate develops where a major change or reform is underway, or an important issue or opportunity arises that creates an environment for a major change which also provides a justification for the change. When the climate is appropriate, effective communication from top management will influence the possibility of change.

Top management communication is one of the most important capabilities for deploying a management innovation (Ackermann 2013). Some researchers have insisted that communication is a central factor for successful innovations (Luoma-aho & Halonen 2010; Moenaert et al. 2000). Communication influences the success of management innovation and the success of the organisation (Hogan & Coote 2014; Keramati & Azadeh 2007). Communication also enables organisations to exploit opportunities for innovation (Gregory et al. 2010).

Pfeffermann & Hülsmann (2011) argue that the communication of innovation is a key component of a firm's cross-functional dynamic capabilities. Due to organisational complexity, and to overcome operational silos within large rail organisations, communication is a significant capability for deploying management innovation. Many comments from participants in the case studies recognised top management

communication as an important capability for deployment of management innovation. This finding is consistent with the idea that top management communicates in order to share goals, create a 'shared thinking' and encourage working towards one goal (Jaatinen et al. 2005; Mäkelä 2002).

Top management communication is vital to make the change happen. Communication for management innovation includes all relevant staff and all stakeholders and happens at all stages of the innovation process from communicating the vision, purpose and expected outcome to deployment of the outcome. All three case studies and the survey results provided evidence supporting the importance of communication and the means used for communicating including newsletters, presentations, video messages and 'road shows'. Road shows are a series of presentations delivered in person by executives and general managers to various levels of the organisation, predominantly to frontline staff, and associated consultation with affected staff and union representatives.

Evidence from the case studies suggests that engaging staff helps to empower people. Collaboration, motivation and communication are vital for engaging staff for management innovation. According to McMullan (2013), the engagement of an employee is considered an important element for the implementation of management innovation. On the other hand, Tansel & Gazîoğlu (2014) studied the relationships of management and employees, and claim that job satisfaction is the most important factor for employee engagement. Empowering staff through innovation by capturing employees' ideas and acting on them may increase job satisfaction.

Research on the charismatic leadership style notes that it motivates staff, provides a process for innovation, and contributes to creating new products or enabling change in the case of management innovation (Barczak & Wilemon 1989; Bossink 2007; Nadler &

Tushman 1990). Involving staff in the innovation process and in the decision-making process encourages them to support the change because staff feel that they are empowered.

Similarly, engaging unions is another important capability. Union representatives are among the most important stakeholders in most large rail organisations. This is because any changes affecting employees' conditions must be discussed with the union representing those employees. Negotiations with union representatives are also referred to as 'employee relations'. Odhong & Omolo (2014) note that factors influencing employee relations include collective bargaining, remuneration, recruitment, communications and safe working conditions. If a management innovation impacts any of these conditions, it needs to be negotiated with the unions.

Large rail organisations are complex and have deep hierarchies which require union consultation for every initiative that impacts employees. The eliminating level crossing incidents case study showed that when management innovation benefits employee wellbeing, the union will support its implementation. In this example, union representatives participated in the innovation workshops. In the Centre of Excellence case study, participants commented that, to encourage their support for change, union representatives were sent to the United Kingdom to personally see how the 'Centre of Excellence for Rail Maintenance' concept is working. Without the support of unions there can be possible resistance to implementing a management innovation.

Leadership theories in the literature reviewed focused strongly on motivation. For example, charismatic leadership motivates staff (Bossink 2007; Nadler & Tushman 1990), while transformational leadership motivates and influences team members to achieve desired goals (Schweitzer 2013). Participants in the case studies recognised the importance of motivation as a capability for deploying management innovation. These

findings also align with the observation by Lee et al. (2015a) that motivation for innovation can lead and influence employees.

Management innovation results in changing management practices and models which may impact how people are mobilised differently from the current work arrangement. Therefore, leaders need to motivate staff to ensure these changes happen smoothly. The range of options for motivation discussed in the case studies include executives participating in meetings and workshops, acknowledging good work, communicating to staff, listening to their needs and addressing the change impacts.

Many comments from the case studies highlighted that management support through motivation can influence and stimulate creativity by treating everyone as equal. Rowold & Heinitz (2007) also list motivation, influence and intellectual stimulation as important capabilities for innovation. Vaccaro et al. (2012) observe that transformational leadership can support innovation in a complex organisation more than transactional leadership. Similarly, Bass et al. (2003) claim that transformational leadership motivates employees to attain organisational goals.

6.3.5 Diffusing capabilities

The findings and discussions from the case studies suggest that elements of the outcome of a management innovation include:

- a solution to a problem for which management innovation was designed
- a new methodology which becomes an ongoing management innovation program
- ongoing management innovation models similar to Balanced Scorecard or Just-In-Time.

For large rail organisations, where a management innovation model is used internally, it may take years to commercialise inventions and the methodology used.

According to Mol & Birkinshaw (2009), management innovation can introduce new practices to the company. Similarly, Hamel (2006) describes management innovation as changes to business practices and models, systems and structures for making an organisation more creative and innovative. From the literature and the case studies, management innovation has introduced new practices. However, it is also worth noting that a management innovation model impacts operational models although, on the surface, it may appear to be an operational invention. For example, a solution for eliminating level crossing incidents may sound like a technical solution, but the approach of handling a major organisational issue using a novel approach and methodology is a management innovation. Similarly, introducing a customer service model resulted in the adoption of new technology and changes to railway station physical environments. While these appear to represent technological innovation, the driving force behind these changes is management innovation because the organisation changed the business principle from a train-centric to a customer-centric approach which allowed the organisation to view customer service differently.

Birkinshaw, Hamel, et al. (2008) note that understanding the consequences and benefits of management innovation is a complex exercise and one that was, at the time, unexplored. They also argue that management innovation can improve productivity and the quality of work life. For rail organisations, the benefits of management innovation cannot be limited to productivity or quality of work life. It also depends on the reason why the management innovation was initiated – which might be improving safety, increasing market share, improving customer satisfaction, retaining business, improving service reliability or reducing incidents.

Evidence in the customer service model case study indicates that there was a 11% increase in customer satisfaction after this management innovation was implemented. The solution for eliminating the level crossing incidents represents a good outcome,

but at the time of writing in June 2017 this outcome was yet to be implemented due to difficulties in obtaining the required funding. In contrast, the centre of excellence for rail maintenance is an innovation outcome that has since become part of the day-to-day organisation culture.

The new methodology that enabled a management innovation can be maintained as an ongoing program. Once the benefit of having a management innovation is demonstrated, the organisation may want to maintain it as a program, or part of an overall innovation program. Hamel (2006) argues that a management innovation process should become part of an ongoing program of invention. The evidence from the case studies and the survey supports that a management innovation requires a process.

From the support systems perspective for deploying management innovation it was determined that project management is a better system to deliver the outcome. Other support system approaches, such as Six Sigma and Total Quality Management, can create a continuous improvement culture, but all three case studies confirmed that these approaches were not considered suitable to influence or support management innovation. It is worth noting that Total Quality Management and Six Sigma are based on a scientific management approach relying on data, evidence and analysis, whereas innovation is based on seeking a novel approach, and the case studies proved that management was looking for novel ideas.

Iakovleva (2014) observed that innovation is mostly implemented through projects, while Snee & Hoerl (2005) argued that project management activities, which include planning the work, estimating and obtaining resources needed to complete the work, assessing the risk, directing execution, organising the work and analysing the outcomes, are also required for deployment of innovation. A project management

methodology assists in deploying the management innovation outcome.

Using a project management approach is recommended by researchers, and supported by evidence from the case studies, with regard to a program and governance framework for management of innovation. Kareem (2014) notes that creativity is the discovery of ideas, and the ideas can be implemented through project management methodology. Iakovleva (2014) observes that innovation is mostly implemented through projects. Comments from the case studies also suggested using a project management methodology and existing organisational practices. This is because in large organisations there are rules and approval processes for obtaining funding and project priorities.

Risk assessment and safety approvals are also mandatory to assure rail safety, and maintain asset and operational integrity to ensure the safety of the travelling public. Large rail organisations generally have excellent project and risk management methodologies with stage gates for approvals and governance in place as they undertake large projects.

The outcome of management innovation could result in a number of projects which require an innovation project portfolio management approach that incorporates a broad variety of methods for evaluating, selecting and prioritising projects for long-term growth and meeting organisational objectives (Killen et al. 2008; Spieth & Lerch 2014).

Birkinshaw, Hamel, et al. (2008) note that there is little knowledge of diffusion of management innovation and how an innovation was generated. O'Mahoney (2007) observes that scant attention is traditionally paid to the diffusion of management innovation. Therefore, it should not be surprising that diffusion of management innovation is the least supported enabling capability for management innovation. This

is because it may require many years to diffuse a management innovation to another situation. However, there was one example from the level crossing incidents case study where the same process was diffused to another major issue of rail track safety.

6.4 Overview of the key findings

This research focused on answering the research question:

How can management innovation capabilities be built in large rail organisations?

To address this overall research question, there were four subsidiary research questions:

- 1) How is management innovation driven in large rail organisations?
- 2) How is a management innovation idea developed as a new concept?
- 3) How is the outcome of management innovation implemented and diffused to other situations?
- 4) How should these capabilities be aligned into a framework that can be used as a guide to implement management innovation in large rail organisations?

This research used a qualitative methodology to explore empirically the capabilities that can enable management innovation and quantitative analysis to validate these capabilities. For the qualitative method, three case studies of large rail organisations were conducted: eliminating level crossing incidents, establishing a Centre of Excellence in rail maintenance, and developing a customer service model. Semi-structured, in-depth interviews were conducted with 36 executives, general managers and senior managers in the three organisations to understand the capabilities that enable management innovation. The comments obtained from participants helped to understand capabilities and refine the theoretical model. The follow-up survey of 70 managers tested hypotheses based on these capabilities. As a result of the literature

review and empirical research, the Management Innovation Capability Framework is developed, validated and finalised. The final framework is illustrated in section 6.2.

The final Management Innovation Capability Framework includes five stages: **discovering** capabilities, **driving** capabilities, **developing** capabilities, **deploying** capabilities and **diffusion** capabilities.

Discovering capabilities require top management to sense the need for a management innovation. Top management discovers opportunities by sensing gaps in customer satisfaction, service quality, understanding customer needs, cost reduction, business growth, and sensing threats. The case study findings support all of the capabilities discussed in the literature, including sensing business opportunities and threats; sensing big gaps in customer satisfaction, quality of service and meeting customer needs; and sensing gaps in using technology to improve performance.

Once the opportunity is discovered, top management commits, supports and drives the management innovation forward by defining the desired radical outcome and commitment to support the business transformation and initiating the management innovation by appointing a senior manager as a change agent, and supporting the vision (what the end results should be) and strategy (how the results will be achieved).

Initial ideas for a management innovation need to be developed further to a potential solution. In order to develop a potential solution an innovation process and working group is required and the working group generates ideas by sharing knowledge. Facilitation and motivation are important capabilities for developing management innovation. Engaging key stakeholders enables sharing information and knowledge and acceptance of the results. The innovation process should also have an idea filtering method and a few selected ideas can be shaped into a new conceptual model that provides a potential solution.

Once the conceptual model is developed, the change agent ensures the appropriate process and governance are established to manage deployment of the management innovation outcome. Having an organisational climate (or change environment) is an important capability for deploying a new management innovation. All three case studies and the survey results supported using a project management methodology for the deployment of management innovation.

Successful implementation of a management innovation provides an organisation with a new methodology, approach and confidence to diffuse to other situations. Diffusion of management innovation takes several years. Examples given in the management innovation literature such as Six Sigma and Balanced Scorecard took decades to market as management innovations. At the same time, the executives who invented these models might have had a commercial interest in diffusing them, whereas large rail organisations are funded by government and opportunities for making revenue beyond delivering rail services are limited. Therefore, the diffusion of management innovation in large rail organisations is limited to diffusing new management innovation models to other situations, or to using a similar approach for other opportunities within the rail industry.

Based on the literature review, case studies and survey results, the final model of the Management Innovation Capability Framework consists of 28 capabilities. Although these capabilities are identified for large rail organisations, the Management Innovation Capability Framework can be applied to any large complex organisation as none of the capabilities is specific to the rail industry. All the capabilities identified can be used as a practical guide for implementing major changes to management models, practices and principles. As such, the Management Innovation Capability Framework answers the overarching research question of how to build management innovation capabilities in a large rail organisation and the subsidiary research questions.

6.5 Summary of contribution

Management innovation is a new addition to the field of innovation research. Recent management innovation studies emphasise the importance of management innovation and its key role in practical application to enhance organisational performance. According to Volberda, Bosch and Mihalache (2014), despite the increase in scholarly articles, management innovation is underrepresented in the vast literature on innovation due to a shortage of novel ideas (Alvesson & Sandberg 2013), dominance of incremental gap-spotting research in management (Clark & Wright 2009), and researcher path-setting scholarly attitude (Alvesson & Sandberg 2013). To accelerate management innovation scholars should apply scientific theory to the problems faced by practising managers (Corley & Gioia 2011). In addition Volberda et al. (2014) suggest that scholars should question accepted management practices and develop new theories.

This research on large rail organisations provides empirical evidence of management innovation, demonstrates how management innovation is applied to practical problems and contributes to both theory and practice. Although the term management innovation is not used by practising managers, it is evident that novel ideas were used in a systemic way to solve problems faced by the practising managers, and to realise significant opportunities to make performance improvements. Findings in this thesis make an important contribution to the growing body of knowledge in management innovation by providing the Management Innovation Capability Framework and associated capabilities for each stage of management innovation.

In addition to the theory, testing the theory provides insight into the capabilities that enable a management innovation from end-to-end within the Management Innovation Capability Framework. Potential benefits of implementing a management innovation

are identified from a theoretical perspective and through three case studies. The main contributions are summarised below.

Contribution 1: Management innovation capability framework

Birkinshaw, Hamal and Mol (2008) proposed a process model for management innovation including motivation, invention, implementation, and theorising and labelling. However Hollen, Van Den Bosch and Volberda (2013) argue that Birkinshaw et al.'s management innovation process model is not clear enough, either conceptually or empirically, to understand the similarities and differences of forms of management innovation such as practice, process, structure and techniques of management innovation. Therefore Hollen et al. (2013) proposed an alternative way to conceptualise management innovation to understand the forms of management innovation using management activities including setting objectives, motivating employees, coordinating activities, and decision making. In addition Volberda et al. (2014) proposed macro level phases of management innovation including generation, diffusion, adoption and adaptation. While these frameworks contribute to theoretical models for management innovation process, forms and stages, this research extends the management innovation theory by contributing a capability framework of management innovation with five stages of management innovation: discovering, driving, developing, deploying and diffusing.

Contribution 2: Capabilities to implement management innovation

The very extensive literature on innovation includes a significant contribution on entrepreneurship, leadership, knowledge management, dynamic capability and support systems in the field of innovation. This research draws on 28 specific capabilities and relates them to different stages of management innovation to help practising managers implement management innovation in large rail organisations. This is a significant contribution of this research as these capabilities are drawn from

an extensive literature review from generic innovation theories to management innovation theory. The research empirically tested and showed that management activities are required at multiple levels with various capabilities for various stages of management innovation. A recent contribution is Volberda et al. (2014)'s three types of management innovation including new to the world, new to the organisation and adapted to its context, and new to the organisation without adaptation. The management innovation capability framework is applicable to any type of management innovation. Having the right capabilities at the right stages will enable the successful implementation of management innovations, whether it is completely novel or an adaptation.

Contribution 3: Definition of management innovation for rail organisations

This research used existing literature and three case studies to redefine management innovation for large rail organisations and describe management innovation for large rail organisations as:

The creation and implementation of new management models, strategies or principles using a novel approach with a desire to make radical changes and diffuse to other situations.

Rail organisations have many traditional management practices. By providing a clear definition, the capability framework can enable a rail organisation to make significant changes to its management models to make radical improvements to the organisation or integrate technology to improve performance.

Contribution 4: Practical application of management innovation

Management innovation researchers have highlighted that management innovation is more difficult to study than technological innovation, as it is more tacit in nature. But the broad applicability of the management innovation construct is also a weakness

(Volberda et al. 2014), as its boundaries are more difficult to define (Birkinshaw et al. 2008), and it is more systemic (Hamel 2006). Management innovation is not only difficult to study, it is also difficult to understand and apply in practice. It was evident in this research that management innovation is overshadowed by the problem managers were trying to solve and the invention or development part of the management innovation draws attention in the process. The management innovation framework provides the boundary for any form of management innovation, where the capabilities were not explicit. The contribution of this research is enabling researchers and practitioners to bridge the gap between research and practical application of management innovation. It contributes to identifying the hidden capabilities of management innovation to extend management innovation theory. Having the Management Innovation Capability Framework available for reference will enable not only rail organisations, but also other public sector organisations, to adapt the framework, implement management innovation and improve all aspects of business to benefit customers and staff by improving products and services and by bringing an innovative approach to management processes.

Contribution 5: Benefits realisation of management innovation

To capture the full benefits of innovation, technological innovation needs to be combined with management innovation, and applying technological innovation to management processes, opportunities and problems can further organisational goals (Damanpour & Aravind 2012; Hollen et al. 2013). The performance of management innovation theory is yet to be explored (Hollen et al. 2013). This research identifies a number of benefits and performance improvement opportunities for implementing management innovation. Potential benefits which can be further explored to extend management innovation theories from the performance perspective and assist organisations to understand and implement management innovation with

technological innovations include:

- solving major problems
- having a new methodology for management innovation
- having ongoing inventions of management models
- improving productivity
- improving quality of work
- improving the work environment
- improving safety
- increasing market share
- improving customer satisfaction
- achieving business growth
- retaining business
- outperforming competition
- improving service reliability
- reducing incidents.

There is opportunity for future research to confirm and extend the benefits, beyond the benefits identified in this research.

6.6 Limitations and areas for future research

This research has provided new insights into management innovation capabilities drawing from leadership and innovation literature. This research has limitations, including limited context, biased qualitative data, limited scope of diffusion and benefits. Each of these limitations presents an opportunity for future research.

The first limitation is related to the context. As management innovation is new to the innovation typology, there are limitations in the theoretical and empirical studies. This research used leadership and generic innovation theories to construct a capability framework for management innovation. There are opportunities for future research studying the role of leadership for management innovation and conducting empirical

studies to validate the management innovation process. There is also an opportunity for further research into the relationship between management innovation and leadership theories from various perspectives such as decisions, management strategies and business models as these topics are closely associated with executive management and business objectives.

The second limitation is that the qualitative data is based on three case studies. Although the selected case studies were on three different aspects of safety, maintenance and customer service in rail service organisations, the results may have been biased due to the nature of the case studies. As the body of management innovation knowledge grows there will be opportunities for further research on more aspects of the industry. This also includes the limitation of scope in covering large rail service organisations only. There is scope to study other public sector, using this framework and potential to extend it to other industries.

The third limitation is management innovation takes many years to diffuse and be widely known. This research was unable to fully cover the diffusion of management innovation because each of the selected case studies conducted was either just recently implemented, or yet to be implemented. Future research can study how diffusion of management innovation occurs.

The fourth limitation is that not all potential benefits of management innovation were fully tested. Some benefits were evident but some benefits discussed in the literature were not evident due to the limitations of the context of the case studies. Future research can be considered to study the potential benefits of management innovation using the Management Innovation Capability Framework.

6.7 Chapter summary

The key outcome of this research was the development of a Management Innovation Capability Framework for large and complex rail service organisations. Although this research focused on rail organisations in Australia, the framework includes generic management innovation capabilities aligned to five stages of discovering, driving, developing, deploying and diffusing. Any large organisation can use this framework to introduce a management innovation to introduce a major change to benefit customers, seize competitive advantages, reduce operating costs and even generate potential new sources of revenue.

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Appendix A. Case study – Semi-structured Interview Questionnaire

Case Study Name:

Driving Capabilities:

- 5) Can you please provide me a background of the project selected for this case study?
- 6) According to you what are the drivers for the selected case study? How this initiative started?
- 7) According to you what value do you think the results of this initiative will achieve? or have achieved?
- 8) Do you believe the market / stakeholder needs had a significant role in this initiative? If yes how?
- 9) What are the collaborative or stakeholder engagement involved in this project? How?
- 10) Have cross functional teams brought together for this case to address significant opportunity or issue? how?
- 11) Do you believe this initiative (Case Study) was only possible due to the initiative of a manager? Can you please describe?
- 12) Do you believe innovation approach made significant improvement in this selected case? If yes how?
- 13) What were the opportunities and/or threat that led the initiation of this project?
- 14) Do you believe the leadership of the project has positively influenced innovation and improvements? if yes how?

Developing Capabilities:

- 15) Do you believe innovation approach made significant improvement in this selected case? If yes how?
- 16) According to you, how were the resources organised? (i.e. interdepartmental, external etc.)
- 17) Have purpose, goals, roles and responsibilities clearly assigned to this project including change facilitation?
- 18) Have cross functional teams, stakeholders come together for this initiative?
- 19) According to you, how the employees were empowered to provide innovative ideas for this project?
- 20) Does the resources were reorganised / reconfigured for this improvement project, including tangible and intangible resources? What are they? How was it organised?
- 21) Was there a collaborative arrangement with internal and external stakeholders to resolve significant issue or to innovate products and new processes? (As applicable)
- 22) According to you, how knowledge created and/or shared and used in this project?
- 23) How learning from past issues, incidents, experience etc. benefited this project?
- 24)

Deployment Capabilities:

- 25) According to you, how staff were motivated in this project?
- 26) Have clear processes and adequate support provided to initiate and complete this project? how?
- 27) What are the strategies does the organisation used to create awareness and commitment for this (case study) initiative?

28) What are the tool and techniques used for this initiative? how well the tools enabled the success of implementation?

29) What are the processes used to carry out the innovative initiatives? e.g Six Sigma, R&D, New Product Development, innovation processes etc.?

Appendix B. Survey Questionnaire



**Management Innovation
PhD Research - Survey Questionnaire**

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Management Innovation (MI) is implementation of new practices in management, performing activities in innovative ways and dramatically changing and enhancing the management functions effectively and departure from current norms. (Birkinshaw and Mol 2006)

	Very Important	Important	Neutral	Less important	Not Important
	5	4	3	2	1
1 Sensing the need for MI (Discover the Need)					
a) Sensing the need to improve service quality drives MI					
b) Understanding customer expectations drives MI					
c) Sensing the need to improve customer satisfaction drives MI					
d) Sensing technology need drives MI					
e) Entrepreneurial alertness drives management innovation					
f) Sensing opportunity for cost reduction drives MI					
g) Sensing business growth drives MI					
h) Sensing threat of losing business drives MI					
2 Top Management Commitment to Drive MI					
a) Top management creating vision and strategy drives MI					
b) Top management sponsorship drives MI					
c) Top management support and funding is vital for MI					
d) Top management desire for innovation drives MI					
e) Risk taking enable to initiate MI					
f) Change agent or sponsor representative drives MI					
g) Commitment for business transformation drives MI					
3 MI Methodology for Development					
a) Development of MI requires innovation process					
b) Taskforce or working group enable the development of MI					
c) Facilitation by experts is vital to develop MI concepts					
d) Ideas generation enable innovative solution					
e) Stakeholder collaborationsupport the development of MI					
f) Filtering & shaping ideas can provide a better solution					
4 Organisational Environment for Deployment					
a) Change environment enable the deployment of MI					
b) Change mindset of staff enable the deployment of MI					
c) Top management communication is vital for MI					
d) Engaing staff is important for deploying MI					
e) Engaing union can reduce resistance for MI					
f) Staff motivation is important for management innovation					
5 MI Outcome & diffusion to Other Situations					
a) Outcome of MI can benefit organisations					
b) New methodology available for Management Innovation					
c) Program and goverance is important for MI					
d) MI methodology can be diffused to other situation					

Demographic Questions*(Please circle)*

Management Level [Manager] [Sr. Manager] [Executive]

Management Experience [<10 years] / [> 10 years]