



University of Technology Sydney

Building Management Innovation Capability in Large Rail Organisations

Matthew Rathinam

A thesis submitted in fulfilment of the requirements
for the degree of Doctor of Philosophy (PhD)

November 2017

Sydney, Australia

Certificate of Original Authorship

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

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Production Note:
Signature removed prior to publication.

Matthew Rathinam
Date: 05 November 2017

This research is supported by an Australian Government Research Training Program Scholarship.

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.

Acknowledgements

I wish to acknowledge many people who have supported and motivated me in the last eight years. It was a great challenge as a part-time researcher to balance work, family commitments and research. I have the privilege of Professor Roy Green, Dean of Business School, as my principal supervisor. My sincere thanks to Roy for taking me on as his student and guiding me with his wealth of knowledge, experience and positive words. I am also grateful to co-supervisor Dr Shantha Liyanage, who motivated me to take up the research and guided me to carry out my research and is very supportive and understanding. It is a great privilege to have Associate Professor Renu Agarwal as my co-supervisor. Renu guided me in every step of this research. Renu's big picture view and attention to detail helped improve the quality of my research.

I have been extremely privileged to work in a large rail organisation and receive great support from my general managers and executive directors for this research. I would like to thank three general managers from the three rail organisations for sponsoring and supporting my research: Cliff Blackley, Nick Dickinson and Glen Barber. It is hard to get access to large rail organisations, and it is also hard to get the time of executives, general managers and senior managers for interviews and surveys. Without the support of these three general managers, this research would not have been possible. I would like to thank my wife Rosemary and my son Prem for their understanding, motivation and extended support. Finally I would like to thank my colleague Mark Worthington for proofreading my thesis and Dr Rhonda Daniels for professional editing.

CONTENTS

1	Management Innovation in Rail Organisations	1
1.1	Introduction	1
1.2	Defining innovation in the public sector	2
1.3	The importance of public sector innovation	3
1.4	Innovation in rail organisations	7
1.5	Management innovation capabilities	10
1.6	Research gap and research question	11
1.6.1	Research Gap	11
1.6.2	Research Question	13
1.7	Research justification	14
1.8	Research methodology	17
1.9	Thesis structure	17
1.10	Chapter summary	18
2	Literature Review	19
2.1	Introduction	19
2.2	Innovation landscape	20
2.3	Defining management innovation	23
2.4	Innovation capabilities from a theoretical perspective	26
2.4.1	Management innovation capability from an entrepreneurship perspective	26
2.4.2	Management innovation capability from a leadership perspective	29
2.4.3	Management innovation capability from a knowledge management perspective	36
2.4.4	Management innovation capability from a dynamic capability perspective	42
2.4.5	Management innovation capability perspective from a support systems perspective	47
2.4.6	Management innovation outcome	53
2.5	Chapter summary	54
3	Research Model	58
3.1	Introduction	58
3.2	Concept of management innovation capability framework	58
3.2.1	Driving capabilities for management innovation	62
3.2.2	Developing capabilities for management innovation	70
3.2.3	Diffusing capabilities for management innovation	75
3.3	Proposed management innovation capability framework	79
3.4	Chapter summary	81
4	Research Design and Methodology	82
4.1	Introduction	82
4.2	Research question	83
4.2.1	Hypotheses	83
4.3	Research approach	84
4.3.1	Mixed methods approach	84
4.3.2	Applying mixed methods	85
4.4	Methodology justification	87
4.4.1	Justification for the use of case study method	87
4.4.2	Justification for the use of survey research	89
4.5	Research design	90
4.6	Qualitative research	92
4.6.1	Research organisations	93
4.6.2	Participants	93

4.6.3	Selecting the case studies	94
4.6.4	Sample plan	96
4.6.5	Qualitative data analysis	96
4.6.6	Qualitative data validity and reliability	97
4.7	Quantitative research	98
4.7.1	Quantitative data collection	98
4.7.2	Sample size	98
4.7.3	Data preparation	99
4.7.4	Quantitative data analysis	99
4.7.5	Quantitative data validity and reliability	100
4.8	Ethical considerations	101
4.9	Chapter summary	101
5	Results – Qualitative and Quantitative	102
5.1	Introduction	102
5.2	Case Study 1: Eliminating Level Crossing Incidents	103
5.2.1	Introduction	103
5.2.2	Level crossing incidents in Australia	103
5.2.3	Background of the case study	105
5.2.4	Data collection	106
5.2.5	Data analysis	106
5.2.6	Driving capabilities	107
5.2.7	Developing capabilities	113
5.2.8	Diffusing capabilities	122
5.2.9	Conclusion of case study 1	129
5.3	Case Study 2: Establishing a Centre of Excellence in Rail Maintenance	132
5.3.1	Overview	132
5.3.2	Background of the case study	133
5.3.3	Driving capabilities	135
5.3.4	Developing capabilities	141
5.3.5	Diffusing capabilities	148
5.4	Case Study 3: Introducing a Customer Service Model for Rail Passengers	157
5.4.1	Management innovation approach for a new customer service model	157
5.4.2	Customer service in the rail industry: Case study	157
5.4.3	Background of the case study	159
5.4.4	Data collection and analysis	161
5.4.5	Driving capabilities	162
5.4.6	Developing capabilities	173
5.4.7	Diffusing capabilities	180
5.4.8	Conclusion of case study 3	192
5.5	Cross Case Study Comparison	194
5.5.1	Discovering capabilities for management innovation	194
5.5.2	Driving capabilities for management innovation	197
5.5.3	Developing capabilities for management innovation	199
5.5.4	Deploying capabilities for management innovation	205
5.5.5	Diffusing capabilities for management innovation	207
5.5.6	Conclusion	208
5.5.7	Summary of capabilities	209
5.6	Survey Research	211
5.6.1	Descriptive analysis	211
5.6.2	Confirmatory factor analysis	222
5.7	Chapter summary	233

6	Discussion and Conclusion	235
6.1	Introduction	235
6.2	Defining management innovation for large rail organisations	236
6.3	Management innovation capability framework	238
6.3.1	Discovering capabilities	240
6.3.2	Driving capabilities	243
6.3.3	Developing capabilities	246
6.3.4	Deploying capabilities	254
6.3.5	Diffusing capabilities	259
6.4	Overview of the key findings	263
6.5	Summary of contribution	266
6.6	Limitations and areas for future research	270
6.7	Chapter summary	272
	References	273
	Appendices	
Appendix A.	Case study – Semi-structured Interview Questionnaire	299
Appendix B.	Survey Questionnaire	302
	List of Tables	
Table 1.1:	Differences between private and public sector innovation	2
Table 2.1:	Enabling capabilities for management innovation from a theoretical perspective	55
Table 3.1:	Management innovation process steps aligned to three capability stages	61
Table 4.2:	Characteristics of the three research organisations	93
Table 5.1:	Level crossing incidents in Australia 2002–2012, by state	104
Table 5.2:	Case study 1 – Driving capabilities	107
Table 5.3:	Case study 1 – Developing capabilities	113
Table 5.4:	Case study 1 – Diffusing capabilities	122
Table 5.5:	Capabilities discovered from the eliminating level crossing incidents case study	131
Table 5.6:	Case study 2 – Driving capabilities	135
Table 5.7:	Case study 2 – Developing capabilities	141
Table 5.8:	Case study 2 – Diffusing capabilities	149
Table 5.9:	Capabilities discovered from the Centre of Excellence case study	156
Table 5.10:	Overall train customer satisfaction in Sydney, 2012–2015	160
Table 5.11:	Case study 3 – Driving capabilities	162
Table 5.12:	Case study 3 – Developing capabilities	173
Table 5.13:	Case study 3 – Diffusing capabilities	180
Table 5.14:	Capabilities discovered from the customer service model case study	193
Table 5.15:	Comparative results – Discovering capabilities	195
Table 5.16:	Comparative results – Driving capabilities	197
Table 5.17:	Comparative results – Developing capabilities	200
Table 5.18:	Comparative results – Deploying capabilities	205
Table 5.19:	Comparative results – Diffusing capabilities	207
Table 5.20:	Summary of capabilities	210
Table 5.21:	Descriptive analysis – Discovering capabilities	212
Table 5.22:	Correlation matrix – Discovering capabilities	213
Table 5.23:	Descriptive analysis – Driving capabilities	215

Table 5.24: Correlation matrix – Driving capabilities	216
Table 5.25: Descriptive analysis – Developing capabilities	217
Table 5.26: Correlation matrix – Developing capabilities	218
Table 5.27: Descriptive analysis – Deploying capabilities	219
Table 5.28: Correlation matrix – Deploying capabilities	220
Table 5.29: Descriptive analysis – Diffusing capabilities	222
Table 5.30: Correlation matrix – Diffusing capabilities	222
Table 5.31: Fit indices and acceptable threshold levels	223
Table 5.32: Regression test results – Discovering capabilities	226
Table 5.33: Regression test results – Driving capabilities	228
Table 5.34: Regression test results – Developing capabilities	230
Table 5.35: Regression test results – Deployment capabilities	231
Table 5.36: Regression test results – Diffusion capabilities	233
Table 5.37: Summary of capabilities after validation	234

List of Figures

Figure 1.1: Outline of Chapter 1	1
Figure 1.2: Public service employee perception of barriers to innovation	5
Figure 1.3: Management Innovation Capability Framework	14
Figure 2.1: Outline of Chapter 2	19
Figure 2.2: Evolution of management innovation	21
Figure 3.1: Outline of Chapter 3	58
Figure 3.2: High-level concept of Management Innovation Capability Framework	58
Figure 3.3: Management innovation capability framework stages and leadership theories	62
Figure 3.4: Driving capabilities	69
Figure 3.5: Developing stage capabilities	75
Figure 3.6: Diffusing capabilities	79
Figure 3.7: Management Innovation Capability Framework	80
Figure 4.1: Outline of Chapter 4	82
Figure 5.1: Outline of Chapter 5	102
Figure 5.2: Survey results of discovering capabilities	212
Figure 5.3: Survey Results of Driving Capabilities for MI	215
Figure 5.4: Survey Results of Developing Capabilities for MI	217
Figure 5.5: Survey Results of Deploying Capabilities for MI	219
Figure 5.6: Survey Results of Diffusion Capabilities for MI	221
Figure 5.7: Confirmatory factor analysis – Discovering capabilities	225
Figure 5.8: Confirmatory factor analysis – Driving capabilities	228
Figure 5.9: Confirmatory factor analysis – Developing capabilities	229
Figure 5.10: Confirmatory factor analysis – Deploying capabilities	231
Figure 5.11: Confirmatory factor analysis – Diffusing capabilities	232
Figure 6.1: Outline of Chapter 6	235
Figure 6.2: Management Innovation Capability Framework	239
Figure 6.3: Process for management innovation from the three case studies	248
Figure 6.4: Idea filtering techniques	253