Perspectives in Project Management

Perspectives in Project Management:

A Selection of Masters Degree Research Projects

Edited by

Anthony Wood
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FOREWORD

The University of South Australia (UniSA) was founded in January 1991 through the amalgamation of the South Australian Institute of Technology and the Magill, Salisbury and Underdale campuses of the South Australian College of Advanced Education. UniSA has an excellent reputation for its high quality, research-informed and industry-relevant academic programs and an enviable record in graduate employability.

Established in 2004, the School of Natural and Built Environments (NBE) focuses on the unique relationships between the natural and built environments, and maintains strong links with industry and government to ensure students gain relevant practical experience, and graduate with sought-after skills and knowledge.

The University of South Australia has offered the postgraduate project management program since the university was founded. NBE now offers the program both online and on campus as a suite of nested, post-graduate programs. Endorsed by the Australian Institute of Project Management (AIPM), the UniSA Master of Project Management degree aims to provide graduates from diverse disciplinary backgrounds with specialised knowledge and skills in project management best practice, as adopted by many government and industry sectors worldwide.

The NBE masters degree also provides students with the opportunity to apply and develop knowledge through a substantial, integrated research project, which has been offered in various forms over the years. To complete this research project, students need to apply expert, specialised cognitive and technical skills from within the body of knowledge of project management, and to independently plan and execute a significant research-based project or piece of scholarship. This monograph captures a selection of research papers arising from this program.

The range of research projects in this publication is a strong indication of the expertise of the graduates. The papers are also indicative of the wide application of project management principles and practice across industry sectors.

I commend the work that Anthony Wood and Raufdeen Rameezdeen have done on this monograph project.

I trust this will be the first of many to come, as we promulgate the excellent research being undertaken by our post graduate students, as they make a valuable contribution to the ever-expanding Project Management body of knowledge and practice.

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Chair, Project Management Advisory Committee
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INTRODUCTION

This book is a monograph—a published volume in which each chapter is a condensed version of a research project undertaken by students in the final year of the online Master of Project Management degree delivered by the University of South Australia (UniSA) through Open Universities Australia (OUA).

Students who successfully completed this program were invited to work with their supervisors and experienced academics to adapt their theses and dissertations for publication in this monograph, as a means of promulgating their findings to the wider project management community.

Accordingly, contributors to this book consist primarily of graduated students of the UniSA Master of Project Management Degree, supported by supervising academics and relevant industry practitioners. As a result, the authors collectively represent current research interests across the breadth of Australia.

This book is organised in four Parts, each of which focusses on a key theme.

Part 1: People and Organisations explores several challenges impacting modern project managers. In Chapter 1, Borg, Wood and Rameezdeen consider the integration of new generations into the "project management family", and Berwick, Rameezdeen, and Wood continue the theme in Chapter 2 by further examining the nature and implications of intergenerational differences. In Chapter 3, Choy, Wood, and Martin investigate the human resource management challenges of working with a fly-in/fly-out workforce, and Lysenko, Nunn, and Wood close out the theme in Chapter 4 by analysing the human side of project management.

Part 2: Methodologies and Practice Domains addresses how we understand common methodologies in today's world of practice, and how these domains can interact with each other. Chant, Martin, and Wood lead off in Chapter 5 by considering knowledge management perspectives in defence projects, and Procurement Practices and their influence on Project

Risk in the Construction Industry is addressed in Chapter 6 by Earl-Spurr, Wood, and Martin. Chapter 7 explores new territory with Kyobe, Larden, and Wood explaining how Agile project management principles can be applied to brownfield capacity improvement projects in the Australian mining industry. In Chapter 8, Ogden, Wood, and Rameezdeen discuss the use of Mobile Technology by Project Managers, and Sarmadi, Beekharry, and Wood investigate improving project performance by adopting control theory methods in Chapter 9. Skinner, Larden, and Wood conclude this theme in Chapter 10 with an analysis of project risk management practices in small to medium enterprises in the Australian Defence Industry.

Part 3: Issues in Application includes reports on investigation of application of project management processes across the arts, infrastructure, and residential construction sectors. In Chapter 11, Selwood, Metcalfe, and Wood report on aspects of integration, application and benefits of project management in the arts sector; Susanto, Wood, and Nunn present their findings from an investigation into management of infrastructure projects in Remote Northern Territory in Chapter 12; and in Chapter 13, Wolff, Beekharry, and Wood address issues concerning integrated project delivery in large-scale residential architecture projects.

Part 4: Continuous Improvement and Benchmarking contains four chapters, each of which examines aspects of quality management in project environments. In Chapter 14, Du Preez, Wood, and Martin benchmark resource company project management maturity, and Richardson, Borg, and Wood discuss the impact of modular construction on the success of liquefied natural gas (LNG) megaprojects in chapter 15. The theme is closed out with a report on process improvement practices in remote Australian construction projects by Renaud, Wood, and Martin in Chapter 16, and an examination by McCowan, Wood, and Martin into the implementation of a continuous improvement program within an Australian engineering firm in Chapter 17.

We are confident this collection of research articles adds to the present-day body of knowledge of project management in Australia and beyond, and demonstrates, at least in part, the great value that student researchers offer to industry and professional practice.

Anthony Wood and Raufdeen Rameezdeen
Editors

ABSTRACTS

Part One: People and Organisations

Chapter One: A Modern Family: Integrating the New Kids into the Project Management Family

The nature and implications of intergenerational differences has been a topic of widespread debate for several decades. Much of the literature contends that differing styles and strategies should be employed in the management of each generation. The premise that project teams commonly involve members of diverse age groups creates a need to consider these differences when managing project teams. Analysis reveals marked variation across a number of application and preference areas between Gen-Y and previous generations in planning and control techniques, tool sets and expectations. The research findings strongly support the notion that generational characteristics play a significant role in the application and expectations of project management tools, techniques and structures. A model is offered for assessment of how prepared an organisation is to harness the positive attributes of younger practitioners.

Chapter Two: Inter-Generational Differences in Project Management: Tools and Techniques

The research addresses issues of generational bias in applied project management. In particular, the study investigates the differences in tools techniques and methods applied by Generation Y (Gen Y) project managers compared to those of Baby Boomers (Boomers) and Generation X (Gen X) respectively. The research utilised qualitative and quantitative methods; interview transcripts were compared to the results of the survey and triangulated via the literature review. The results demonstrate an over-riding consensus that whilst some generational differences exist, there are no major distinctions in preferences for tools and techniques. Research into this area will produce a wealth of new knowledge, as the available literature on the topic is limited due to relative newness of the topic and the slow recognition of project management as a professional discipline.

Chapter Three: Management Challenges with a Fly-In/Fly-Out Workforce

The Fly-in/Fly-Out (FIFO) workforce is increasingly being used in the Australian resource and construction industry to mobilise labour and skilled workers to remote locations. This study investigates the management challenges of working with a FIFO workforce from a human resource management (HRM) and organisational design perspective. Thirty-one current FIFO workers were interviewed in this exploratory study, and data was analysed using a qualitative phenomenological methodology. The study showed that the FIFO workforce presents unique challenges to human resource management practices and the organisational design which enable successful project delivery, particularly in the determining of policy to maximise employee satisfaction, designing the organisation and the level of decentralised decision making. Project managers seeking to maximise productivity and project delivery from the FIFO workforce will find this research useful in planning and managing the project team and stakeholders.

Chapter Four: The Human Side of Project Management

The human side of project management is an underlying element of risk management. This research investigates the element of human psychology in project management and its potential to affect project outcomes in the context of project risk management in a team environment. This research was undertaken using questionnaire and face to face interviews with project managers and project team members. It was found that the element of human psychology is present in the project risk management area, with the potential to affect project teams by influencing decision making processes and consequent project outcomes. This research demonstrates that an understanding of the human element in project risk management in a team environment, including the appreciation of individual characteristics and behaviours of team members, is essential to successful team decision making. When implemented effectively, this understanding leads to a cohesive team environment with the appropriate level of risk appetite, resulting in a higher probability of successful project delivery.

Part Two: Methodologies and Practice Domains

Chapter Five: Knowledge Management in Australian Defence Projects

This study investigates the inability of project team members to capture tacit knowledge and convert it into explicit knowledge. The practices of a range of Australian Defence companies was analysed to discover when, how and what information was gathered, whether they had management support and a knowledge vision, and whether they had a dedicated person who had responsibility for knowledge management. The investigation was conducted by means of a small-scale survey of elite respondents in the project management field. The key finding of this research was a common failure of the companies to convert more of their tacit information (conversations, phone calls and personal information) into explicit information. This conclusion is significant because most knowledge generated on projects is tacit, so if this knowledge is not converted to explicit knowledge, there is significant time wasting and expense incurred in having to re-solve a problem that was encountered and solved on a project previously, but was not documented.

Chapter Six: The Influence of Procurement Practices on Project Risk in the Australian Construction Industry

Poorly managed procurement risks can lead to large project delays, cost overruns and quality defects, yet many procurement decisions do not consider risk as highly as other criteria such as cost. This contradicts directly with what some researchers believe – that procurement risk should be the prominent criterion that determines the selection of a procurement method. The aim of this research is to investigate the influence that procurement practises have on project risk to better understand their effectiveness. The study consisted of a case study of a single organisation with multiple, large construction projects and a supporting literature review. The case study method primarily involved interviews with procurement specialists within the case-study organisation. The research found that the selection of an appropriate vendor is more effective in mitigating project risk than attempting to transfer risk onto partners or using monitoring and control practises. Therefore, most efforts to mitigate procurement risk should be directed to those practises that assist in choosing the best project partner.

Chapter Seven: Application of Agile Project Management Principles to Brownfield Capacity Improvement Projects in the Australian Mining Industry

Agile Project Management (APM) methods revolutionised how software projects organised. Recently, these methods have been used in hardware infrastructure projects. However, the question of how to be agile during brownfield capacity improvement mining projects requires further investigation. This research investigates the application of APM practices with a particular focus on brownfield capacity improvement projects in the Australian mining industry. A range of published works (1986-2014) is examined to identify trends and interconnections. Twelve project practitioners were surveyed to gain an overview of the Australian mining industry, and one practitioner was interviewed to validate the theories presented. It was found that APM provides flexibility in the project management approach as it allows the project team to iterate towards the required project outcome. Thus, mining organisations who require working products through the project life cycle are likely to APM Scrum framework to be useful in brownfield capacity improvement projects.

Chapter Eight: The Use of Mobile Technology by Project Managers

There are a variety of tools and technologies available to support the communication and management of information used by project managers. The introduction of mobile technology has changed communication in the workplace and made information more accessible than ever for project managers. The research aimed to determine the drivers that influenced the adoption of mobile technology by project managers and to gain an understanding of how technology is changing how project managers manage project information and communication. Data was collected using two research methods: a document review process and a survey questionnaire issued to project managers. The study found that many project managers regularly use mobile devices to access a variety of software applications to conduct various project management activities. By gaining an understanding of the usage trends an insight into how the use of mobile technology may influence the approach to project information and communication management is obtained.

Chapter Nine: Improving Project Performance by Adopting Control Theory Methods

Reasons for project failure continue to vary based on perceived understanding of project behaviour due to mixture of internal and external factors, while the need for underlying theory remains a concern. This study investigates the potential application of methods used in control theory to project management in order to improve project performance. A sample project was used in MATLAB to produce a transfer function model. The model was then simulated using SIMULINK for comparison. The result showed that if the output of a project is controlled to follow a desired input set point by using control theory then the performance of the project that has a closed loop configuration will be improved. The research outcome can contribute to understanding project behaviour, project modelling, and more importantly, to provide new ways of controlling project performance.

Chapter Ten: Project Risk Management Practices in Small to Medium Enterprises in the Australian Defence Industry

Defence acquisition projects are characterised by high levels of complexity, manifesting in technical and programmatic risk. This research aims to better understand contemporary project risk management practices within small to medium enterprises (SMEs) participating in the Australian defence industry. SMEs employ half of all Defence industry workers and receive one third of acquisition spending, making them a significant contributor to project outcomes. A survey methodology was used to investigate project risk management practices in SMEs, and a review of major defence project performance data was conducted in parallel to provide context. Survey findings were mapped to a project risk management maturity model and analysed to determine maturity levels in defence SMEs. The research finds that most SMEs exhibit mid-range project risk management maturity. Results of the review into major project performance are significant in terms of their characterisation of an industry beset by schedule and cost over-runs, leading to a recommendation for further research.

Part Three: Issues in Application

Chapter Eleven: Project Management in the Arts: Integration, Application and Benefits

Today's arts industry produces shows, exhibitions and festivals that impact society and culture. As 'temporary endeavours' with specific goals they can be defined as 'arts projects', yet some perceptions within creative arts projects preclude the application of a formalised project management methodology. This research investigated the links between project and arts management to determine whether project management tools are adaptable or appropriate for arts projects. An online survey and in-depth interviews were undertaken to gather data about which project management tools were currently being applied, and to explore the application and potential benefits of applying project management tools to arts projects. The research found that some formal project management methods are being utilised in the arts, however there is room for further application, particularly in the areas of cost, time risk and communication management. The outcomes of this research may assist arts organisations to understand the benefits of formal project management, while creating a path for future interdisciplinary research opportunities between project management and arts management.

Chapter Twelve: Effective Management of Infrastructure Projects in Remote Northern Territory

There is limited literature that discuss the challenges and strategies in managing infrastructure projects in Australia's Northern Territory (NT). This study makes recommendations for project managers to overcome these challenges. A literature review on the management of remote projects was conducted to determine the challenges and strategies in delivering projects in remote locations. Data was collected from core members of project teams who have delivered projects in remote NT by online survey and interviews. The study found that nine out of the thirteen challenges in delivering remote projects that were identified from literature have either high or extreme risk scores. Furthermore, most strategies identified in literature were found to be at least moderately effective in overcoming the challenges in delivering remote NT projects. The findings of this study will help project managers delivering essential infrastructure projects in remote NT to focus their efforts on mitigating the risks associated with challenges with high or extreme risk scores and to find ways to implement the strategies found to have high effectiveness.

Chapter Thirteen: Integrated Project Delivery in Large-Scale Residential Architecture in Australia

Although there has been a huge interest in integrated project delivery (IPD), the current adoption status of IPD remains relatively small. This paper investigates whether a shift from 'traditional' project delivery methods (PDM) towards IPD can be expected for large scale residential developments in Australia in the near future. The research included a comparison between design-bid-build (DBB), design-build and construction management at risk with IPD as well as a survey of 52 industry professionals, using structured web-based questionnaires. It was revealed that, although a majority of respondents regard DBB as an effective PDM for these projects, a majority of participants also do see IPD as a possible alternative. Additional findings showed that most respondents also believed that a shift towards IPD would result in enhanced design quality, construction quality and industry innovation. The results may encourage organisations within the industry to move away from 'traditional' project procurement towards a more integrated approach.

Part Four: Continuous Improvement and Benchmarking

Chapter Fourteen: Establishing and Benchmarking Project Management Maturity

The primary objective of the research was to establish a baseline of project maturity for a resource company, identify key gaps and make recommendations for improvement. The initial focus of the research was to explore project management maturity models that may be best suited for use or to be adapted for use in assessing project management maturity in the resources and energy sector in Australia. A survey was conducted with a sample of employees at the subject company by using the selected Kerzner Project Management Maturity Model. The results established a benchmark for the organisation and provided a relative assessment compared to companies of similar size. Gaps in project management maturity at the company were identified and recommendations were made for improvement, which ultimately is anticipated to improve the probability of success of the project pipeline at the company. The resultant "case study" provides a useful model by way of example for other organisations undertaking project management maturity assessment.

Chapter Fifteen: The Impact of Modular Construction on LNG Megaprojects

This study investigates whether a link exists between modular construction strategies used on Liquefied Natural Gas (LNG) megaprojects with associated cost and schedule overruns, focussing on the root causes of overruns and identifying mechanisms to reduce them from reoccurring. Published works were examined to identify differences in project execution strategies and known causes of overruns on megaprojects to date, and data was gathered by surveying and interviewing experienced participants in the LNG industry for insight to real issues experienced during project execution. The results identify that problems lie more with the ineffective management of construction strategies, particular within project controls, engineering, quality control and material management. The key recommendation is to minimize the transfer of scope from fabrication yards to the final construction site as this is a major contributing factor to the overruns. Organizations will find the recommendations in this research a useful aid during the up-front planning of LNG project execution.

Chapter Sixteen: Case Study: The Implementation of Process Improvement in a Remote Australian Construction Project

The remote Australian construction industry has some of the most unique demographics in the world and research to date has not significantly focused on process improvement techniques. This research demonstrates that a process improvement approach for construction companies, adapted for the challenges of the remote work environment, can deliver significant competitive advantages for the company. This research included a review of existing literature on process improvement as well as a qualitative, opinion-based survey of professionals currently working within the remote Australian construction industry. A key conclusions of this research is that management commitment and communication are essential for process improvement to be successful in a remote construction context. Furthermore, all parties need to be aware that process improvement takes a significant investment of time to implement. With this in mind, an intentional commitment from both management and employees to the process is of greater importance in remote projects than metropolitan projects.

Chapter Seventeen: Case Study: Implementation of a Continuous Improvement Program within an Australian Engineering Firm

This research examines the use of Continuous Improvement (CI) and how it can be employed to streamline the day to day operations of a manufacturing company. The primary focus was the attempted implementation of a CI program within an Australian based engineering and manufacturing firm, and was undertaken to gain an insight into the difficulties associated with program realisation. The research concentrated on a series of interviews of those involved at a working level, providing a new perspective from the typical top-down approach presented in most available literature. Whilst the company involved was unable to successfully implement the program over the research timeframe, it was possible to identify several areas where improvements could be made. These included increased worker training, increased staff motivation and program buy-in, and a more developed project management structure. The results presented can help other companies avoid the pitfalls associated with implementing a CI program.

PART ONE:

PEOPLE AND ORGANISATIONS