Project Management Performance in Saudi Arabia: An Exploratory Study into the Constructs that Most Influence Project Success

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DEDICATED TO

My wife

Soha Alajam

And my lovely daughter & son

Joud & Hesham

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STATEMENT OF ORIGINALITY

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Candidate ***Salem Shuaib*** ***Date***

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LIST OF ABBREVIATIONS

AMOS	Analysis of Moment Structures
ANOVA	Analysis of Variance
APM	Association for Project Management
ARAMCO	Saudi Arabian Oil Company
BPM	Building Project Management
CBA	Cost–Benefit Analysis
CDSI	Central Department of Statistics & Information – Saudi Arabia
CPM	Critical Path Method
CSR	Corporate Social Responsibility
CSF	Critical Success Factors
EFQM	European Foundation for Quality Management
EVM	Earned Value Management
ISO	International Organization for Standardization
IT	Information technology
JEC	Jazan Economic City
JIT	Just-In-Time
KAEC	King Abdullah Economic City
KEC	Knowledge Economic City
KPI	Key Performance Indicator
KSA	Kingdom of Saudi Arabia
MANOVA	Multivariate Analysis of Variance
MoP™	Management of Portfolios
MSP	Managing Successful Programs
NHMRC	National Health and Medical Research Council
PM	Project Management
PMI	Project Management Institute
PMPA	Project Management Performance Assessment
PMPAC	Project Management Performance Assessment Construction
PMPQ	Project Management Planning Quality
PRINCE2	Projects IN Controlled Environments, version 2
QM	Quality Management
QMS	Quality Management System
R&D	Research & Development
RADAR	Results, Approach, Deploy and Review
RBV	Resource-Based View
SAGIA	Saudi Arabian General Investment Authority
SCE	Saudi Council of Engineers
SEM	Structural Equation Modelling
SMEs	Small and Medium Enterprises
SPSS	Statistical Package for the Social Sciences
TQM	Total Quality Management
UAE	United Arab Emirates
VRIN	Valuable, Rare, Inimitable, and Non-substitutable
WBS	Work Breakdown Structures

ABSTRACT

The research study reported in this thesis is focused on investigating the success of Project Management Performance (PMP) during the delivery of a project and the effect on success of project completion outcomes. The projects were completed in the public and private sectors in Saudi Arabia. By examining specific project implementation methods and processes, the research was used to address three specific questions:

1 *What is the role of project management implementation variables, such as leadership, lifecycle process, staff, partnerships and resources, policy and strategy, financial, change management and key performance indicators in the various projects within Saudi Arabia?*
2 *In particular, to what extent do project change management practices influence project management performance outcomes in Saudi Arabia?*
3 *And what are the challenges facing project management performance practices in Saudi Arabia?*

The literature review presents previous research encompassing project management performance, which shows the value of applying project management performance models to determine the effectiveness of specific variables that influence project outcomes that can lead to project success. The research reported here expands the previous research and similarly shows how certain project management attributes can both add value and increase the likelihood of project success. Furthermore, it expands the contextual model to include project change management, which enhances the relationships between the variables and increases the level of understanding about what change management within the project environment can bring to a project in terms of successfully translating plans into action and accomplishment. No previous research into the impact of project change management on project management variables during project development and implementation in Saudi Arabia was found during an extensive search of the literature. Including the management of change as a tool in project management thus provides a more holistic model than those currently available.

The research was conducted using a quantitative web-based survey, which targeted both public and private organisations in Saudi Arabia that have managed projects, and yielded 419 valid responses. These responses were further validated, analysed and tested within the proposed conceptual framework. The research included two phases of statistical analysis, descriptive and structural

equation modelling (SEM) was employed to prove the models validity. The results showed that *staffing*, *project change management* and *policy and strategy* in Saudi and international organisations were the most important aspects of *leadership*. There were divergent elements between Saudi and international organisations located in the KSA as to the employment of *financial management practices*, which in Saudi firms was a function of project change management, while in international organisations it was predominantly an aspect of policy and strategy.

Saudi and international organisations also diverged as to the emphasis each placed on project change management. For Saudi Arabian firms, *change managemen*t was the second most critical aspect of both business and project strategy after leadership. Whereas, for international organisations with representatives in the KSA, *policy and strategy* was deemed the second most important attribute, reflecting the regional influence that looks to policy and strategy to market projects. This view extends the concept of the operational influence that *policy and strategy* has in projects. By establishing policies and strategies that embrace a clear culture of versatility, the ability to adapt to project change through increased project support can increase project success. By having strategies that include promoting project awareness, and a policy of open feedback, enables goal clarification and opportunities to refine processes, thus implement project change management.

This research contributes both theoretically and on a practical level. On a scholarly level, the research extends the development of knowledge regarding project management performance and specifically the use of the project management performance assessment model (PMPA). On a practical level, it acknowledges the value of staff, which affirms the regional need for skilled labour to achieve project goals. This finding strongly argues for more training and education programs in the region, since the persistent lack of the appropriate skill mix poses challenges and has serious implications for project managers.

Project Management Performance in Saudi Arabia:

An Exploratory Study into the Constructs that Most Influence Project Success

Chapter One

INTRODUCTION

Project management performance (PMP) and its measurement, that is, discovering the impact that project management has on a project, has not resulted in significant improvements that have resulted in project successes, despite the progression of the discipline of project management, the techniques applied or the systems employed. This research study undertook to evaluate the effectiveness of PMP in Saudi Arabian organisations by utilising a quantitative research methodology to investigate current practice and knowledge across project-orientated organisations in the kingdom. The research assessed specific factors in PMP with the aid of the Saudi Arabian Council of Engineers. Eight specific PMP variables were used for the evaluation of project management in the participant organisations: leadership, staff, policy and strategy, partnerships and resources, life cycle management processes, key performance indicators, financial management practices, and change management.

Chapter 1 outlines the framework of the research thesis and describes the topic, the relevant background, identifies the gaps that fed the research questions, outlines key terms and definitions, and clearly elucidates the need for the research topic to be explored. Additionally, the chapter provides a concise overview of the research methodology and methods, explains what PMP models are, along with relevant hypotheses, and notes the contributions and limitations of the research.

1.1 Background to the research

PMP has been questioned extensively in the project management profession, by academics and in the literature for its' failing to consistently deliver positive project outcomes (Fortune & White, 2006; Kerzner & Saladis 2009; Toor & Ogunlana 2010; Langston 2013). Most recently, Mir and Pinnington (2014) have noted that despite developments in project management systems as a whole, there have not been marked improvements in project outcomes. Consequently, the capacity of project management to increase its level of effectiveness and offer value continues to be regarded sceptically (Horine 2012; Kerzner 2013; Mir & Pinnington 2014).

Over the past decade, research in the area indicated that there were still advantages for organisations to have a project management system, particularly if it is established and mature (Kwak & Ibbs 2000; Bryde 2003a; Marques, Gourc & Louras 2011; Crawford 2012). This is

confirmed through the increased adoption of project management (PM) methodologies and tools by the project management sector from 2002 to 2011, as reported by Fortune et al. (2011).

Regardless of the increased uptake of PM, the debate as to the value of PM is still based in how project success and failure are viewed. In order to understand those factors that influence project success, de Lancer and Holzer (2001) describe them primarily as falling into two inextricably linked categories – rational/scientific and political/cultural, which are highly correlated. The rational/scientific category is supported by Ramage and Armstrong (2005) who asserted that, in fact, the historical methodology that has been used to evaluate project success has impeded performance measurement, which brings into doubt the accuracy and validity of measurements of success and their reliability (Steinfort & Walker 2007). Steinfort and Walker (2007, p.1) have suggested, '…there are useful project management (PM) approaches that may be universally applied to most, if not all, projects to contribute to successful PM delivery.' Such that, there are issues with the practical application of these project management approaches, as they are only effective in specific contexts, and that while theoretically these PM approaches are valid they may not all be in actuality. Conversely, Thomas and Mullaly (2007) argued that the most effective factors for PMP success are the project manager's experience, the organisation and project size.

However, according to Fortune and White (2006), PMP success can be attributed to specific factors such as:

- a strong and clear detailed plan kept up to date
- support from senior management
- good communication and feedback
- and clear realistic objectives.

While de Lancer and Holzer (2001) have found correlative links between factors that influence success and failure, determining the link between project success and PMP has not been so straightforward (Cooke-Davies 2004; Stefanovic 2007; Din, Abd-Hamid & Bryde 2011). This is largely due to the complexity of the models that contain similarly complex constructs. Results are often inaccurate, inconclusive and disjointed (Steinfort & Walker 2007). For example, in a study conducted by Brown and Adams (2000) that utilised a construct model for building project

management, the results showed no benefits of project management in terms of cost or time, and indicated PM actually adversely impacts on project quality.

Research such as this (de Lancer & Holzer 2001; Cooke-Davies 2004; Steinfort & Walker 2007; Stefanovic 2007; Din, Abd-Hamid & Bryde 2011) clearly illustrated the need to investigate further the value and impact of PMP modelling in order to determine its value in this field. Research is limited in this area, however, making it difficult for organisations to justify the expense and commit to using project management processes and tools (Mir & Pinnington 2014).

Saudi Arabia currently has US$629 billion worth of construction projects, of which 70% are in the design, bidding or construction phase. Such an enormous investment in time, money, planning and the nation's future requires success to avoid economic and social disaster for the country (SaudiRail 2014). The scope of such project development reflects a desire to diversify the country's economy away from sole dependency on oil reserves. The Saudi government has committed to invest in infrastructure, transport, healthcare, education and social welfare in order to safeguard the country's economic sustainability (SaudiRail 2014; Saudi Arabia 2014).

Saudi Arabia has set aside $500 billion for investment over the next six years for infrastructure projects, and the need to undertake PMP as a way to measure success is imperative. Traditional measurement techniques and methods have not accounted for the scope and complexity of organisational projects when assessing the value PM provides (SaudiRail 2014; Thomas & Mullaly 2007). In fact, Toor and Ogunlana (2010) categorically state that the iron triangle measurements of time, cost and quality are no longer a valid means of assessment and that assessing project effectiveness, the efficiency of resource utilisation, stakeholder satisfaction, and project safety are emerging as factors of measurement within construction.

Assessing value in projects therefore can be seen to have increased in scope in terms of what is measured beyond cost, time and quality to include variables such as risk and environmental impact. In some instances the number of variables like technical variables, along with traditional cost, time, quality, and risk have posed a barrier to measuring PMP as the indicators those variables have produced have become so vast that they defy accurate assessment and are considered to generic (Pich, Loch & De Meyer 2002; Crawford & Pollack 2007; Lauras, Marques & Gourc 2010).

Given the significant financial investment being made by the Saudi government, the inability to evaluate projects and poor project performance now and into the future will curtail private and foreign investment and hamper modernisation and diversification. Therefore, there is a need to comprehend those factors that exhibit the greatest influence over PMP success in order to observe and assess their impact both manageably and meaningfully.

Previous research into project management in Saudi Arabia has shown the scope of the problem and that the failure of projects in the kingdom can predominantly be attributed to project delays (Faridi and Al-Sayegh 2006). Delay is a recurrent theme across projects, resulting in project incompletions, project failures and escalating costs (Al-Kharashi & Skitmore 2009; Alfaadel, Alawairdhi & Al-Zyoud 2012; Almajed & Mayhew 2013; Ali, Al-Sulaihi & Al-Ghatani 2013), and has not been limited to any specific industry sector (Al-Dubaisi 2000; Taylor & Ford 2006; Goff 2008).

Saudi Arabian project success particularly in the IT sector is a mere 48% according to Alfaadel, Alawirdhi and Al-Zyoud (2012) and delays in the construction sector are so pervasive that 70% of all projects do not meet their completion deadlines (Assaf & Al-Hejji 2006). Furthermore, these delays range from 10% to 30% of the total project time (Assaf & Al-Hejji 2006), thus it can be surmised that these delays cost significant sums of investment and have knock-on implications. The scope and size of the issue is such that the frequency of project failures and the significant financial investment warrants research to understand those factors that can influence project success.

While Crawford (2005) stated there was no correlation between PM performance and project success, this argument has been wholly refuted by other research noted above. Therefore, given the significant failure rates and delays in the two sectors mentioned, it was deemed necessary to explore the potential value a PM performance model could offer to improve project outcomes and reduce failure rates. Currently, the methods employed are not achieving enough success and this could directly influence project investment in the future, which in turn would affect Saudi society.

Dealing with this issue is imperative for government-sponsored programs of development, where significant sums of money are invested in providing public service and supporting infrastructure (Al-Kharashi & Skitmore 2009), including roads and railways, healthcare and education. Delays

and failures in these projects have a significant impact on public budget allocations, as well as public services and confidence. With such significant capital investments allocated and forecasted, delays also reduce the funds available for future since escalating costs associated with delay must be met by money reserved for future projects (Al-Kharashi & Skitmore 2009).

1.2 Project management performance

It is necessary to define the concept of project management performance (PMP) given the perceived benefits of it. However, the definitions of PMP are as varied as the variables used to define it. Kerzner (2013), who does not use project management process indicators as a way to measure success, focuses on clearly defined business objectives to identify and assess PMP. Defining project value is also problematic (Thomas & Mullaly 2007), due to the many variables involved, defining project success and determining how projects should be measured is also difficult (Mir & Pinnington 2014). In fact, Muller and Jugdev (2012) argued that there is no succinct definition of project success, but that there is a need to design and implement measurable constructs to illustrate what project success is.

Bryde (2003a, p.229) suggested that there is a need to evolve the definition of PM performance to embrace 'multi-dimensional/multiple stakeholder/quality of process, as well as product' approach as a way to define project success. This was a view shared by Jugdev and Müller (2005) who contended that how project success is perceived had evolved from the limited perspective of how the implementation phase was defined, to a broader view across the project life cycle. In the construction sector, Forcada Matheu (2005) similarly suggested that there has been an evolution of traditional project management practices, yet the management techniques, information technology and those practices had failed to meet the level of demand that new projects require.

Din, Abd-Hamid and Bryde (2011) asserted that the ISO 9000 framework served to regulate project practices as a way to achieve project success. In both cases, the evolutionary construct of the model has extended the European Foundation for Quality Management (EFQM) model and provided a broader understanding of those relationships both internal and external within the project organisation that influence project success. A lack of clarity of many key aspects of PMP like defining value, or what to measure, and how to measure it do exist (Resch 2011). However, several key assumptions can be made; firstly, the failure rate of past projects has driven the need for

project management to justify its use and effectiveness. Secondly, the one size fits all approach, which could be construed to have been the traditional cost, time and quality approach, must now be considered obsolete as suggested by Toor and Ognulana (2010). The current need is to tailor the indicators to represent the variables and factors that are considered imperative by the stakeholders (Kerzner 2013). Furthermore, it should be noted that the emergence and continual development of PMP assessment is in such a state of evolutionary flux that rigidly defining it would be problematic while it has yet to evolve to a sufficiently sophisticated level that the success of its usage can be clearly examined and thus defined and measured.

For the purpose of this research study, a stakeholder is defined as any individual, organization or group who directly can influence and or be affected by any decision made or activity undertaken within the scope of a project (PMI 2013a). In this research, the definition of PMP assessment has been grounded in the Din, Abd-Hamid and Bryde (2011) PMPAC model that took the PMP assessment model and included financial management implementation practices to provide extended value in measuring PM performance. Din, Abd-Hamid and Bryde (2011) used Bryde's (2003a) PMP assessment model that was derived from the EFQM business excellence model and concluded that those organisations with ISO 9000 certification had improved project outcome performance.

The Bryde (2003a) model has been used successfully by Westerveld (2003), Bryde (2003a), Qureshi, Warraich and Hijazi (2008), Rehman, Usmani and Al-Ahmari (2012), Humaidi and Asarani (2012) and Mir and Pinnington (2014), as a possible framework to assess PMP. Bryde's (2003a) developed his model from the EFQM business excellence model and conducted an analysis of 63 projects across 22 industry sectors that included construction in both government and private sector organisations. Din, Abd-Hamid and Bryde (2011) extended the model and applied it to the Malaysian construction industry. In doing so, they identified a number of critical success factors (CSFs) of whether the:

- project was completed as per schedule
- project was completed within budget
- completed project was managed in deficient manner
- project was completed within acceptable quality
- output from completed project functioned as expected

- output from completed project is used by its intended user
- output from completed project has directly benefited the intended user
- output from completed project has had a positive impact on the client's performance
- output from completed project has a positive impact on my company's business results
- companies have learned from the completed project and this will lead to better projects in the future.

Furthermore, the Din, Abd-Hamid and Bryde (2011) model evolved Bryde's (2003a) PMPA model and added significance by considering financial management implementation practices within the construction sector. The PMPAC model (performance management performance assessment for construction) included a criterion that is an essential element in project success (cost) and measures various financial aspects throughout the project life cycle.

By exerting financial control, the success of the project from this perspective can at least be monitored, as the research literature suggests (Jones, Jimmieson & Griffiths 2005; Meyer et al. 2007; Din, Abd-Hamid & Bryde (2010). With the PMPAC model, the augmentation of financial management practices within the construction sector bodes well for accounting for price fluctuations like raw materials and other resources (Din, Abd-Hamid & Bryde 2011). Lifting the standard of project financial management practices has the power to initiate other important changes, highlighting as it will the factors that shape project performance and success. Previously Qureshi, Warraiach and Hijazi (2009) had endorsed the PMPA model in an assessment of project management in 9 industries in Pakistan. In their research, they used 16 KPIs, none of which over lapped with the KPIs used in this PhD research. Mir and Pinnington (2014) conducted a multidimensional study of continuous improvement in project-based organisations, which endorsed the approach of this research and particularly the use of the PMPA model. The PM KPIs endorsed in their research included PM performance, project efficiency, impact on customer, impact on project team business success, preparing for the future and project success (Mir & Pinnington 2014).

For this research, it was necessary to add change management to the selection of management skills to be considered, as change management has proven highly valuable in improving project performance (Ibbs, Wong & Kwak 2001). Adding value to projects through financial decision-making has been deemed highly beneficial (Alaghbari, Kadir & Salim 2007). Thus exercising

project change management when it pertains to financial procedures, project costs, and reducing financial risk so as to ensure financial returns, are seen as imperative (Cook 2004, Jarocki 2014). Similarly, by factoring in provisions for project changes as a means to promote a level of preparedness circumvents the 'cost trade-off' that can occur when change management activities occur outside of project planning (Jarocki 2014). Project change management decision-making creates a transformative state, thereby affecting a potentially valuable effect that can influence project success (Parker et al. 2013). Avoiding project failure is essential as this consequently affects organisational change (Jarocki 2014), therefore the importance of financial provisions for change can be deemed essential.

1.3 Research gaps

A review of the project management literature revealed three areas requiring more investigation in the context of Saudi Arabia. The first was the issue of delays and overruns that have plagued projects in the kingdom for over 30 years. Second, the PMPAC model has been under-researched. Lastly, the use of project change management as a criterion for successful project management has never been tried before, but offers promise of new insight into PMP in Saudi Arabia.

1.3.1 Delays and overruns

Failures of past projects within the Kingdom of Saudi Arabia have been noted in the research literature (Al-Kharashi & Skitmore 2009; Almajed & Mayhew (2013) as attributable to significant delays. With the extensive investment in construction projects in Saudi Arabia and proposed continual development, ensuring on time delivery and minimising delays would reduce the inherent financial costs associated with delays. Studies over the past 30 years have illustrated a consistent pattern of delays over a range of projects (Zain Al-Abidien 1983; Al-Sultan 1987; Al-Khalil & Al-Ghafly 1999; Al-Khalil & Al-Ghafly 2004; Al-Kharashi & Skitmore (2009); Almajed & Mayhew 2013).

The financial implications of project delays extend beyond the escalation of expense to the subsequent follow-on costs, which have been a recurrent theme in project failures in the KSA (Faridi & Al-Sayegh 2006). Besides the direct cost of having to pay for delays, there is also a microeconomic loss as the delays restrict the contractors' ability to undertake other projects, meaning revenue foregone, in economic terms, an opportunity cost that cannot be rectified.

1.3.2 The need to test the under-researched PMPAC model

There is evidence of the PMPA model being utilised in research, but not the PMPAC model. Therefore, a need to both conduct research employing a variation of the PMPAC model and extend the model seemed necessary both theoretically and for practical value. The researcher found no other studies using the PMPAC model had been conducted. Qureshi, Warraich and Hijazi (2008) conducted a survey using Bryde's (2003a) model by employing the six criteria to evaluate organisational project performance and determined the latent value of this framework. Rehman, Usmani and Al-Ahmari (2012) similarly conducted a study using the PMPA model using the same 6 criteria (PM leadership, PM Staff, PM Policy and Strategy, PM Partnerships and Resources, PM Lifecycle Management Processes, and PM Key Performance Indicators) to identify those operational factors that affect PMP. Recently, Mir and Pinnington (2014) also used the PMPA model and added a hypothesis linking PM to PMP. In all three studies (Qureshi, Warraich & Hijazi 2008; Rehman, Usmani, & Al-Ahmari 2012; Mir & Pinnington 2014), the researchers found that PMP highly influenced project success.

However, the Qureshi, Warraich and Hijazi (2008) study focused on Pakistani organisations, with Mir and Pinnington (2014) looking at organisations in the United Arab Emirates (UAE), while Rehman, Usmani and Al-Ahmari (2012) was the only study that looked at Saudi Arabian organisations. For Qureshi, Warraich and Hijazi (2008) and for Mir and Pinnington (2014), key performance indicators (KPI) were the most crucial criteria, something that has been thoroughly studied by Ali, Al-Sulaihi and Al-Gahtani (2013). Ali, Al-Sulaihi and Al-Gahtani (2013) determined the ten most important KPIs to include in a project management measurement model to evaluate performance in the construction sector by grouping them into three categories of financial, customer, internal business as a means of evaluating performance. Within the financial category, they suggested that from their research profitability, growth, financial stability, and cash flow were the most important. With the customer that, quality of work, external customer satisfaction, and market share were most imperative, and with internal business, the three KPI's were safety, business efficiency, and effectiveness of planning.

The three articles in question noted the need to expand the research in this area, with Qureshi, Warraich and Hijazi (2008) specifically noting the need to expand the research as to population size beyond the 50 respondents. For Rehman, Usmani and Al-Ahmari (2012) the study only had

115 respondents and they too suggested a broader scoped research study in Saudi Arabia to develop a full spectrum of PM operational factors for benchmarking performance. The most recent research by Mir and Pinnington (2014) still only sampled 154 responses, and not in Saudi Arabia.

Mir and Pinnington's (2014) findings led the researchers to suggest that further research into PM performance and those variables that affect project success is needed; by developing a framework that focuses on KPIs, this would support the findings of Ali Sulaihi and Al-Gahtani (2013). It is clear from the literature that a research study using a model that includes a focus on leadership and KPIs as part of the framework is necessary. Targeting Saudi Arabia and measuring PMPAC and project success across both the public and private sectors where the research sample would be significantly larger than those already used would have both a practical and academic value.

Clearly, the research indicates a need to delve further into the effect PMPA can have on project success and expand its scope by including additional criterion like change management and thereby benefit Saudi Arabian organisations' in their quest for project success. In considering the additional criterion of change management with the PMPAC model, it is not only expanding on the Din at al. (2011) model and but evolving the development of the framework and including a fundamental aspect of business. Bryde (2003a) has previously noted a need to circumvent those project management barriers that prohibit change.

1.3.3 Change management

Conducting a study into the success of Saudi projects and project management using the PMPAC with change management as an assessment model would be a first in Saudi Arabia where research into the practice of project management has been non-existent according to Alfaadel, Alawirdhi and Al-Zyoud (2012). Furthermore, Mir and Pinnington (2014) most recently noted that despite advances in the use of project management within organisations, there has been a lack of research conducted on the connection between PMP and the value it attains when correlated with the required investment to undertake project management in the first instance.

For this research, change management was added as a viable management implementation method, as change management has had a proven track -record of transforming situations not unlike organisational changes (Parker et al. 2013) especially in capital intensive situations and has yielded successful benefits (Partington 1996). Khan et al. (2014) stated that change management is

essential in reducing project costs and project time when the organisation has adopted change as part of its culture. Project management change particularly within the construction sector has predominantly looked at change from a process and method approach and deviations from the primary plan (Park & Pena- Mora 2003).

It is common practice for project managers to affect change within a project by adjusting project scope or project tasks in order to achieve project deliverables (PMI 2012). Project change management can be seen to extend this to the interaction between leadership and staff given change managements effect on human resources by effecting behavioural changes as well as those processes (PMI 2012). Given the nature of the scope of problems within Saudi Arabia and the size of investment involved, this research will consider change management within the project environment specifically in relation to leadership and financial management practice to understand how project change management is enacted within Saudi projects.

1.4 Research study objectives

From the issues discussed above came several clearly defined research objectives:

- to utilise an existing model framework (PMPAC) and extend this by including one new criterion, thereby expanding the application and development of the PMPAC model and advancing the research in this area of project management
- to undertake a comprehensive research study across all organisational sectors in Saudi Arabia involved in project management, to evaluate the level of understanding of PMP assessment and measure the scope of training, application and success of project leaders and projects in the region
- to expand the theoretical knowledge of PMP by devising original research that can contribute to the field of study
- to investigate the correlation between specific project management criteria and how these criteria influence project outcomes
- to understand how change management affects project performance
- to comprehend the existing challenges and barriers that prohibits successful implementation of PMP.

1.5 Research questions and hypotheses

The research questions for this study were devised around two central themes – PMP and project success – across both public and private organisations in Saudi Arabia. With regard to project performance management, the questions are focused on those criteria that influence project performance. It is from the relationships of those variables that the second theme naturally flows from their correlation and scope of influence over project success.

The criteria employed in the PMP model have been shown to have significant effects on project outcomes, and are therefore worthy of further investigation in the context of project management in Saudi Arabia. The current research has expanded the number of criteria under investigation to increase the framework in order to comprehend the effects those criteria have on project success.

Of specific interest among the criteria were the effects of change management on the project outcomes in order to improve the knowledge surrounding project success and failure. The research questions guiding the current study were answered by evaluating the criteria set out in the conceptual model, including change management. The final question sought insight into the specific obstacles that project leaders face in project implementation, from which a correlation can be drawn with elements of the conceptual model. The three research questions were:

1 What is the role of project management implementation variables, such as leadership, lifecycle process, staff, partnerships and resources, policy and strategy, financial, change management and key performance indicators, in the various projects within Saudi Arabia?
2 In particular, to what extent do change management practices influence PMP outcomes in Saudi Arabia?
3 What are the challenges facing PMP practices in Saudi Arabia?

The research necessitated the use of a hypothetical model in order to understand the associations between the variables. Thus, a model was constructed using 11 hypotheses (Figure 1.1). Primarily the hypotheses were constructed from the seven criteria as taken from the Din, Abd-Hamid and Bryde (2011) PMPAC model, with the addition of change management. The 11 hypotheses were labelled H1, H2, H3, H4, H5, H6, H7, H8, H9, H10 and H11. Using the hypotheses enabled the researcher to investigate their associations to answer the research questions. These constructs formed the framework of the conceptual model.

Path			
H1:	Leadership	⟷	Staff
H2:	Leadership	⟷	Policy and Strategy
H3:	Leadership	⟷	Partnerships and Resources
H4:	Leadership	⟷	Change Management
H5:	Staff	⟷	Life Cycle Management Processes
H6:	Policy and Strategy	⟷	Life Cycle Management Processes
H7:	Policy and Strategy	⟷	Financial Management Practices
H8:	Partnerships and Resources	⟷	Financial Management Practices
H9:	Change Management	⟷	Financial Management Practices
H10:	Life Cycle Management Processes	⟷	Key Performance Indicators
H11:	Financial Management Practices	⟷	Key Performance Indicators

Figure 1.1 Eleven hypotheses devised for testing

The 11 hypotheses were formed from specific research study findings and associations of the seven criteria and adapted to include the new variable change management as follows.

H1 – H3 were derived from Bryde (2003a, p. 233) and the EFQM model where the emphasis is on PM staff and resources, policy and strategy, and partnerships and resources

H4 – leadership and change management was a new hypothesis derived from the need to examine this relationship within the context of the research study. It was deemed integral to understanding change management within the framework of the model.

H5 – was derived from the correlation in Qureshi, Warraich and Hijazi (2008) that noted a strong relationship with PM performance. It followed that if leadership was strongly correlated to PM performance and that project life cycle was similarly a significant factor (Rehman et al. 2012, p. 147) what effect would staff have on the project life cycle thus influencing project performance.

H6 – was derived from Bryde (2003a), Mir and Pinnington (2014) as there is a strong correlation between policy and strategy shaping organisations and project success and since project success includes project life cycle it can be inferred that there is a relationship between these two variables.

H7 - since Kerzner and Saladis (2009) and Din et al. (2011, p. 1053) noted the value of financial management practices in improving outcomes, it follows that integrating financial management practise within the context of PM policy and strategy could add value.

H8 – Din et al. (2011, p. 1052) noted that there were limitations in the impact of this relationship and yet partnerships and resources plays a significant role in construction projects and can heavily influence the financial outcome of project success. Mir and Pinnington (2014, p. 205) noted the impact that partnerships and resources has on project success, thus it followed that since suppliers could heavily influence the budget that this could influence project success or failure.

H9 - this was a hypothesis created to examine the influence of change management practices enacted upon financial management practices within the project life cycle to determine if they could affect project outcomes successfully.

H10 - as noted on page 15 several authors were listed as stating the significance of KPI's in project management performance and project success. Qureshi, Warraich and Hijazi (2008) and Mir and Pinnington (2014) noted the importance of KPI's and the project life cycle management processes. The significance and value to evaluating the project life provides benchmarks for decision making and thereby an ability to make change management decisions to effect project outcomes, so is significant and must be tested.

H11 – Din et al. (2011, p. 1053) stated that there was greater value for financial management practices when measured against established KPI's, thus the value of this hypothesis serves to increase the likelihood for financial success of the project.

1.6 Defining the PMP model for the research

The conceptual framework model used in the research was developed using an existing PMPAC model (Din, Abd-Hamid & Bryde 2011) consisting of seven variables (project leadership, staff, policy and strategy, partnerships and resources, life cycle management processes, key performance indicators),financial management practices, and by extending it with one new criteria change

management. These variables formed the basis of the constructs in Figure 1.1, to which was added change management, and enabled the hypotheses to be devised. Thereby, the model was used to investigate possible relationships in order to answer the research questions. Previous research using PM performance modelling has been somewhat restricted, so the model was expanded to overcome the constraints and increase the possible associations between variables by considering the key findings of other research in the area of change management (Figure 1.2) (Ibbs, Wong & Kwak 2001; Din, Abd-Hamid & Bryde 2011; Parker et al. 2013).

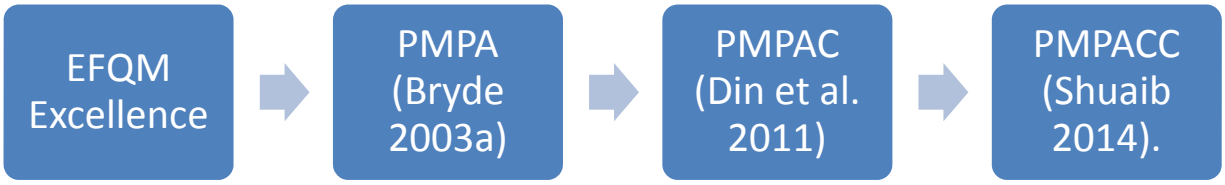


Figure 1.2 **Charting the development of the research model that now adds change management to the previous models**

The model above illustrates the development and advancement of the framework model over time. This model was developed outside of the PMBOK ten knowledge areas (PMI 2013a) as they are designed to develop PM skills and that the importance of these and the associated correlations are unknown (McConachy & Caine 2003). The eight variables of the conceptual model extend beyond the direct skill set of one individual project manager as the factors determined by Bryde (2003a) and Din, Abd-Hamid and Bryde (2011) are significant influencers of project performance. Therefore, it can be concluded that the PMBOK areas of knowledge that are skill areas of the project manager are narrow in focus and could be construed as a sub set of the project leadership area of the model and were deemed not broad enough for examining the factors that affect project performance as a whole (2013a). In addition, the PMBOK areas of knowledge (PMI 2013a) are not contained within the PMPA or PMPAC models.

Given continued project failings and the limitations of the iron triangle the importance of increasing resource utilisation within the PM framework it was contended by Cullen and Parker (2015) this could be achieved by integrating RBV within the project management framework. The justification for using the PMPAC model can be seen as a response to Thomas and Mullaly (2007), Toor and Ogunlana (2010) and Pretorius, Steyn and Jordaan (2012). Toor and Ogulana (2010)

specifically stated that traditional measurement methods were unable to address project scope and complexities. In addition, Backlund, Chronéer and Sundqvist (2015) held that there are concerns regarding the capabilities of project management measurement with bodies of knowledge. Pretorius, Steyn and Jordaan (2012) noted there were a multitude of influences that affect project performance besides those of standard practice, such as the skills and competencies of the project leader. These contentions can be construed to mean that there is a need evidenced by excessive project failure as found in Saudi Arabia that the traditional approaches to PM and measurement through the use of the iron triangle and PMBOK have fallen short in delivering project success, thus a new approach to project management performance and assessment is required. This thesis will undertake a comprehensive research study, including organisational sectors in Saudi Arabia that use project management practices to evaluate the level of understanding of project implementation methods being employed in practice. Furthermore, it will contribute to the theoretical knowledge of project management implementation, and increase understanding of how change management can affect and contribute to implementation practices.

1.7 Synopsis of research methodology

The research was conducted using an online questionnaire that drew upon personnel information from the Saudi Arabian Council of Engineers. Project managers in both public and private organisations were invited to participate in the survey. The questionnaire was designed around the 11 hypotheses, and structured using two existing online questionnaire formats, that of Din, Abd-Hamid and Bryde (2011) and Zou and Lee (2008). The first section of the online questionnaire was based on the work of Din, Abd-Hamid and Bryde (2011), while Zou and Lee provided guidance for the final five questions related to change management practices, as well as how they are related to project change performance.

The use of an online survey instrument enabled the easy transfer of data into various software applications, such as Microsoft *Excel*, IBM *SPSS* v. 20, and a sequential modelling software program for analysis. Chapter 4 discusses and explains the research questions, hypotheses, methodology and design in detail, along with the application of the constructed model outlined in Chapter 3.

The total number of participants who completed the survey was 419. They were drawn from the Saudi Arabian Council of Engineers and represented managers in project leadership roles in their organisations. Over 3200 potential participants were identified, representing a broad range of organisations across the region, including all industry sectors as outlined in Chapter 5 Analysis and Results. This number and range of potential respondents ensured a good representation of public and private project managers would be available to answer the research questions. *SPSS* (Statistical Package for the Social Sciences) was used to conduct descriptive analysis. In addition, structural equation modelling (SEM) software *Analysis of Moment Structures* (AMOS) and *Smart-PLS* (partial least squares) were used to test, verify, validate and analyse the data, including conducting path and factor analysis, and to investigate and predict correlations between variables.

1.8 Research contribution

The current research contributes to the field of project management both at a theoretical and practical level. From a theoretical level, the research undertook to use an existing model (PMPAC) and modify it into an unproven conceptual framework for testing, and is contributing to the knowledge. It was anticipated that by expanding the existing PMPAC model to include project change management, the resulting model would provide a more expansive framework through which current project management practices in Saudi Arabia could be viewed and relationships between the variables assessed and interpreted.

From a practical perspective, the results of the study will help to explain those factors that are causing project failures, and thereby impede project success by illustrating what factors are critical to PMP and project success in Saudi Arabia. This information, while particular to the relevant geographic area, can add significant value to organisations that undertake future projects. The theoretical framework devised can provide a model that could be applied to future projects and potentially reduce project delays and cost overruns and thus increase PMP. From the framework model, specific correlations will provide the requisite information for Saudi Arabian organisations to consider when undertaking projects with a view to greater focus on the more critical factors that have the greatest influence on PMP and success.

1.9 Research scope and limitations

The research study encompassed public and private sectors that are involved in project management in Saudi Arabia with the goal of providing comprehensive results that would offer a conclusive understanding of those variables that most influence PMP and success in Saudi Arabia. However, given the nature of the online survey, the sample response rate was lower than ideal. Thus, the findings and conclusions drawn may not be generalizable across all organisations in the Kingdom of Saudi Arabia and may not apply to other geographical areas.

1.10 Thesis structural outline

The organisational structure of this thesis is as follows.

The thesis consists of seven chapters, with **Chapter 1** introducing the background of the research problem with a description of the research rationale. It further discusses the research objectives and questions, along with an outline of the methodology (Chapter 4), the research model and hypotheses (Chapter 3). Finally, Chapter 1 elucidates the contribution the study makes to the field of study and the research limitations.

Chapter 2 discusses the theoretical framework and the contextual model fundamental to the research, i.e., the resource-based view theory (RBV), along with the literature review. The literature review analyses the research in the context of project management, with the intention of extracting relevant information, including definitions, the underlying issues of project management within the context of PMP, and the construction sector in Saudi Arabia. Additionally, the chapter discusses the issue of project success along with the broadening development of PMP. In addition, the chapter discusses financial management practices and change management, and how they provide substantive value in measuring project success. It is from this earlier research that the conceptual model outlined in Chapter 3 is derived and it provides the requisite framework for the hypotheses to be investigated.

Chapter 3 explains the conceptual model that was employed to conduct the study, exploring the research questions and hypotheses. The chapter elucidates the constructs and the interrelationships between the variables and their value in terms of project management, with specific emphasis on project leadership, staff and KPIs as these factors have been identified as critical to project success

(Thomas & Mullaly 2007; Alshawi & Ingirige 2003; Qureshi, Warraich & Hijazi 2008; Rehman, Usmani & Al-Ahmari 2012; Kerzner 2013; Mir & Pinnington 2014).

Chapter 4 discusses the research design, the methodology and methods employed to conduct the study. Firstly, it presents the philosophical purpose and justification for the research. This is followed by an outline of the research questions and hypotheses. Subsequent to this, the researcher explains the methodology, design and methods of the research, as well as the justification for using a quantitative research method. After which, there is an explanation of the study population, sampling, costs, and the measurement tools used. The chapter then provides an in depth discussion of response rate, data collection and data analysis, covering both descriptive and structural equation modelling (SEM) analysis using MS Excel and IBM SPSS v.20. Chapter 4 concludes by explaining the testing, validation and evaluation of the model before outlining the characteristics of the sample population. Finally, the overall validity, ethical considerations and study limitations are outlined.

Chapter 5 reports on the analysis of the findings and results from the online questionnaire. The chapter presents the methods employed to clean the data, the demographic responses, followed by a descriptive analysis of the data before undertaking a discussion of the SEM findings, the testing of the model findings and the interpretations of the model. The results are then presented in both narrative and tabular format with graphs, charts and illustrations of the model to support evidentiary findings.

Chapter 6 records the outcome of the comparison of the results of the analysis with the insights from the literature review. The chapter provides discussion of the analysis by looking for affirmation of previous research undertaken or specific anomalies that may have occurred. It looks to present the answers to the research questions that were presented with a view to having met the research objectives.

Chapter 7 concludes the research by summarising the objectives and conclusions and makes recommendations for future research. Limitations of the research are briefly discussed, and the contributions of the research noted.

Chapter Two

LITERATURE REVIEW

Chapter 2 discusses the literature related to the research topic, as well as the contextual foundations for the research study. The research was undertaken to explain the levels that organisations in the KSA have achieved in implementing PMP practices. The chapter examines several key aspects of the research, the conceptual model that framed the investigation and the theory that reinforced this model. Additionally, the chapter discusses the theoretical foundations for the research undertaken that are used in the following chapters.

In order to contextualize all the components of this chapter, the first section examines the need for PM implementation performance models, the relevant theory behind it and the significance of using these models in order to enhance performance. The second section presents the models used the conceptual model that framed the research and its measurement tools. The third section presents project change management as another dimension by which to measure PM implementation performance. Finally, the fourth section summarises the ideas contained in the chapter.

The 2013 PMI's Pulse of the Profession report specifically accentuated the importance of project goals, budgets and timelines as they relate to organisational survival in a global competitive environment, and stressed that in order to flourish project success rates needed to improve (PMI 2013b). Saudi Arabian project success has been limited, regardless of the industry or the scope of the project, and there have been many since oil was discovered in 1938 (Bowen 2008). This history of failure has implications for PMP in the Saudi Arabian context (Al-Dubaisi 2000; Faridi and Al-Sayegh (2006). The limited project success is attributable to two conditions: project incompletions (Goff 2008) and a significant number of project failures (Taylor & Ford 2006) due to substantial delays and cost overruns (Frimpong, Oluwoye & Crawford 2003; Al-Kharashi & Skitmore 2009; Alfaadel, Alawirdhi & Al-Zyoud 2012; Almajed & Mayhew 2013; Ali, Al-Sulaihi & Al-Ghatani 2013).

2.1 Theoretical framework of the research project

Project management has taken on a broader application within organisations globally across all sectors from its origins in defence, aerospace, construction and engineering (Crawford 2000a). Given increased global competition, organisations are continually looking to increase efficiencies

and create competitive advantages. Improving organisational performance has become integral to strategic initiatives and, therefore, project management implementation methods now play a significant role in developing strategies to achieve positive project outcomes (Crawford 2000b). Within this context, management practices are central to understanding how the practices of project managers influence project management systems. The current research examined a relevant managerial theory as a way to analyse the strategic value that management and quality can have on project management.

Given the extensiveness and pertinence of management research literature, there was a need to frame the content relevant to the current research and highlight the theory and model that were used to underpin this research (see Figure 2.1). The disciplines of strategic management and quality management both evolved from theories on management and quality. One theory, the resource-based view (RBV) was used and the project management performance assessment in construction (PMPAC) model was examined as a base model for the current research. Figure 2.1 illustrates clearly the outline of the research study by showing the association between the literature review, the disciplines, theories, and the contribution to organisational performance.

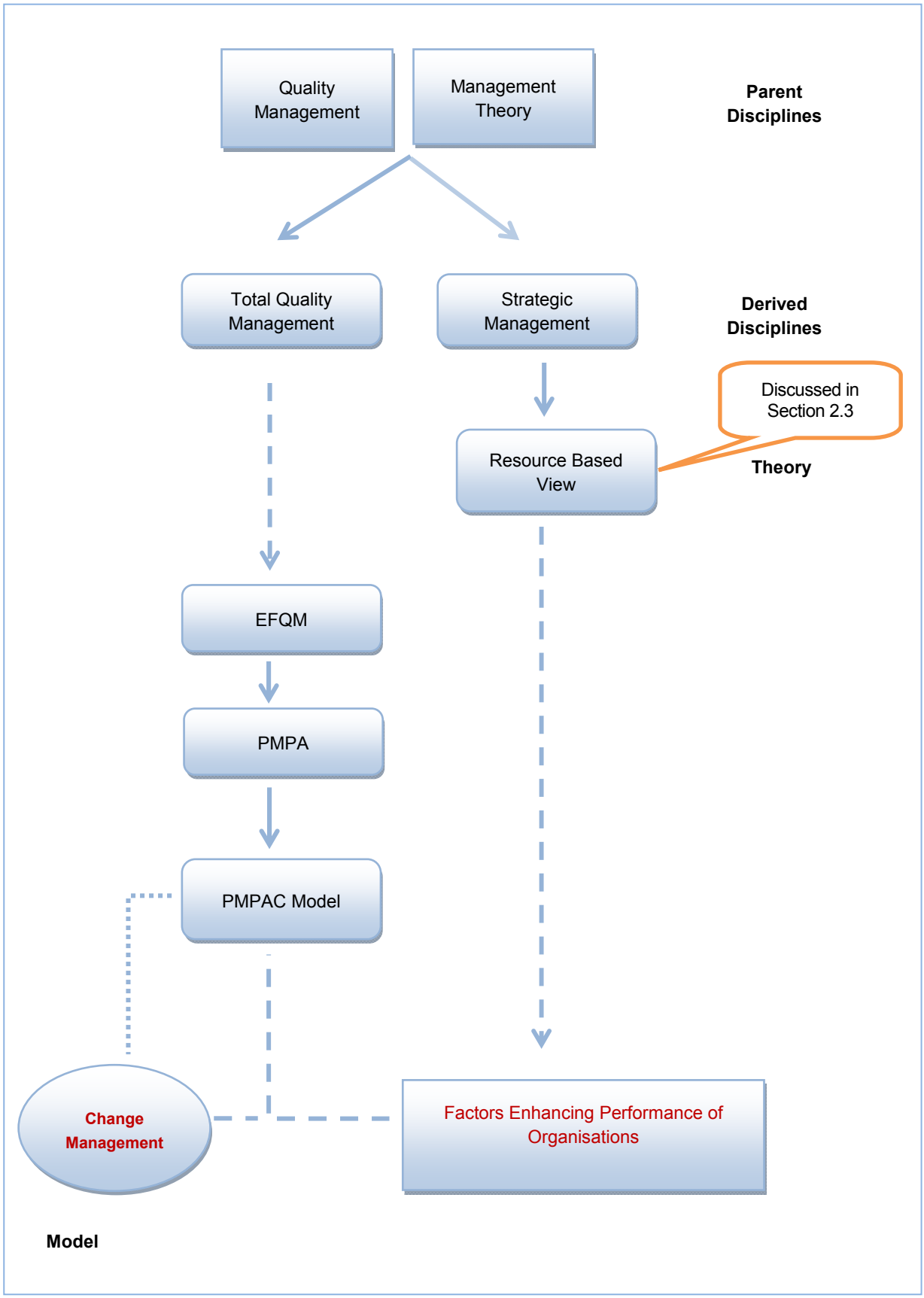


Figure 2.1 Context of the study

2.1.1 Defining strategy

The most relevant and significant area of study within management theory is that of *strategic management*, which considers the aspects of organisational performance and how management influences performance. Strategic management was defined by Porter (1996) as an organisations ability to outperform the competition by doing things differently. While this has been the benchmark for defining strategy for some two decades, a more recent and broader definition is that of Nag, Hambrick and Chen (2007) that considers strategy from an operational perspective within internal and external environments.

Exploring the relationships that exist and explaining how these are related to performance can be undertaken in a multitude of ways. Certain theories need not be considered for this research study, for example, *stakeholder theory* espoused by Freeman (1984). Freeman (1984) postulated the concept of stakeholder value and considered how to meet the needs of the varying stakeholder interests. Freeman (2008) has subsequently emphasised that organisations must be managed for all stakeholders, not merely the shareholders, by creating value. A key aspect of stakeholder theory has been the need to comprehend the connections between stakeholder management and organisational objectives. Donaldson and Preston (1995) stated that stakeholder theory has several discrete facets that are equally necessary, one of which is descriptive. This descriptive feature elucidates the behavioural characteristics of organisations, including managerial aspects, when used in research studies.

The *resource based view* (RBV) theory was chosen because of its focus on the use of resources and their causal connection, which affect organisational performance. It is through the employment of these resources that RBV creates a foundation for an organisation to achieve a competitive advantage (Wernerfelt 1984; Barney 1991; Halawi, Aronson & McCarthy 2005). RBV considers an organisation's strategic assets as highly valued and scarce; that is, imperfectly imitable and non-substitutable (Halawi, Aronson & McCarthy 2005). As such, RBV is considered as 'fit for purpose' for this research, whereas stakeholder theory was not deemed appropriate. RBV as a theoretical framework has a proven applicability in both strategic and quality management. According to Jugdev (2004) at that time, PM had not been studied within the RBV framework from a strategic asset perspective, and that by doing so it would enable a broader understanding of how PM can add value by creating a competitive advantage. In doing so, it would facilitate how organisations could

strategically invest in the correct practices as a means to 'develop those internal assets relevant to positioning project management strategically' (Jugdev 2004, p. 15). Jugdev (2004) suggested that by understanding the connections between PM and strategy and those factors that could influence competitive advantage PM professionals would be able to acquire the knowledge to develop frameworks and theories. It was from those theories that the theoretical foundation was constituted, which framed the emphasis for this research study. The research was grounded in the fields of quality and management sciences, specifically the areas of total quality management (TQM) and strategic management.

In using RBV theory and the PMPAC model as foundations, this research study centres on an holistic conceptual model that by definition looks to explain the causal connections between an organisation's strategic resources and its performance in a project environment. In addition, the literature review in this chapter explains supplementary relationships, which are analysed within the context of PMP.

2.1.2 Conceptual model

Figure 2.2 illustrates the conceptual model constructs examined by the research study. The constructs that make up the model are categorised as project implementation enablers and results. They include leadership, lifecycle process, staff, partnerships and resources, policy and strategy, financial practices, change management and key performance indicators. More detail is offered in the next chapter. The Figure 2.2 also describes the conceptual relationships in this study.

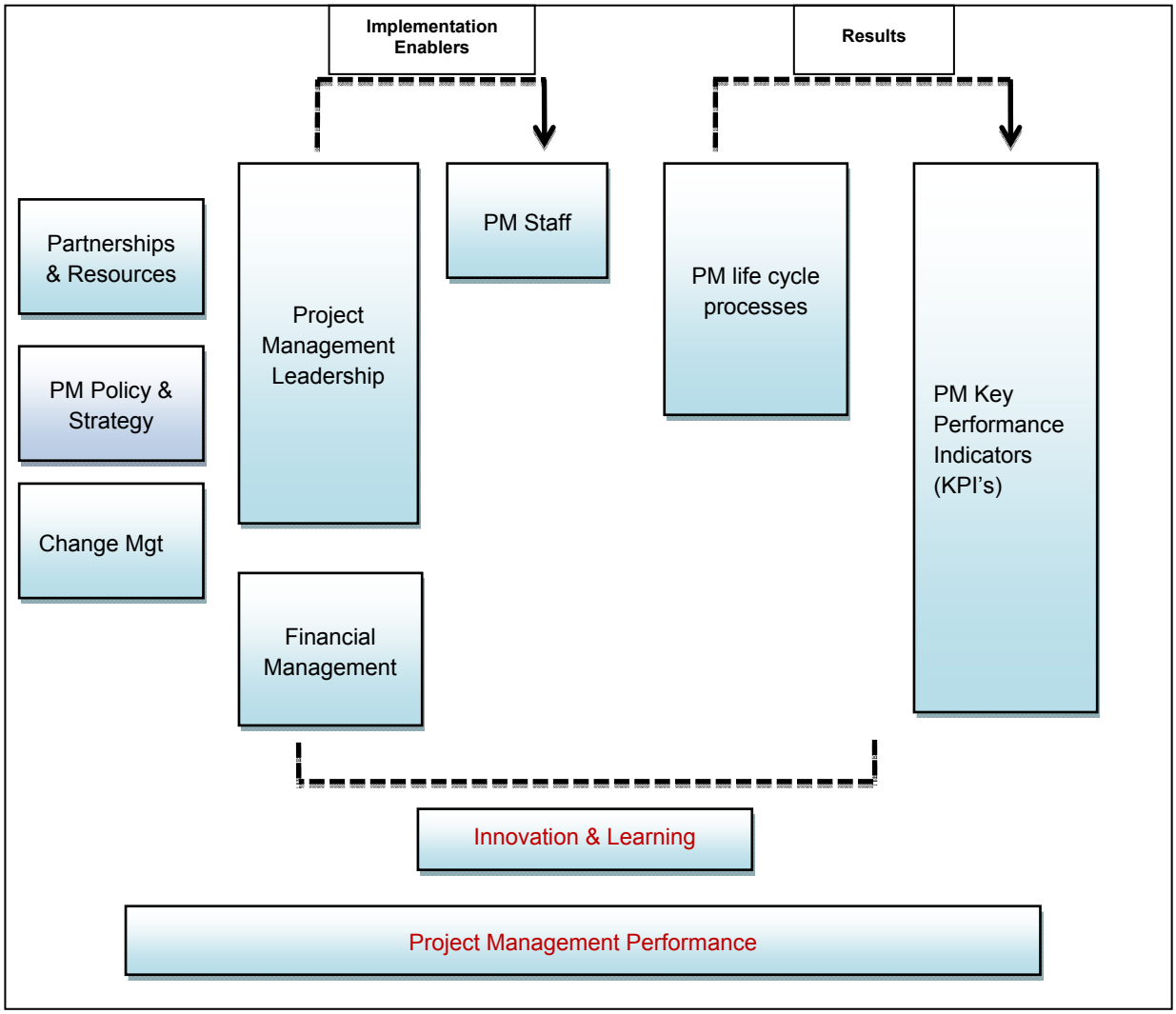


Figure 2.2 The conceptual model of this research study

Figure 2.2 illustrates the connections of the constructs that were investigated in this research study. By applying RBV to the conceptual model, the resources are interpreted to mean increasing performance in specific construct areas that result in organisational improvements, such as increased efficiencies, which improve organisational performance over competitor organisations. It is through the strategic use of organisational resources and their deployment in normal business operating activities that organisations endeavour to create a competitive advantage. Project management is a tool that can when aligned strategically across an organisation add value to sustain competitiveness and 'consistently deliver business results' (PMI 2010, p. 1). Project management is achieved by the performance of those projects that thereby deliver business outcomes, such that project success is critical to organisational success (PMI 2010). Thereby, the importance of project management strategies and performance is essential in this process.

This research considers that the organisation's resources are assets that enhance PMP. Furthermore, the research theorises that project management and organisational performance are related to how those drivers are employed. It has been asserted that RBV should consider both tangible and intangible resources (Kapelko 2002; Galbreath 2005; Halawi, Aronson & McCarthy 2005). However, for the purposes of this study, the research focused on intangible resources that were valuable, rare, inimitable, and non-substitutable (VRIN) (Barney 1991; Wade & Hulland 2004). These indicators signify the organisation's strategic resource capability (Wernerfelt 1984; Barney 1991) and their ability to employ them both strategically and efficiently; they are discrete in that the resources are subject to each organisation's culture and are unique to that organisation. It is a firm's VRIN that can create and sustain a competitive advantage (Barney 1991), and for the purpose of this research understanding the extent to which firms not only have and employ the efficiently will indicate their likelihood of project success. As such, they are not transferable, cannot be duplicated and create a unique competitive advantage to that organisation. Resource utilisation is central to attaining a competitive advantage it follows that to be successful the employment of resources and how they are managed is critical.

Figure 2.3 Conceptual model involved in RBV

Figure 2.3 illustrates the three central components enmeshed in RBV, through which employment of those resources yields increased organisational performance. For the current research, the resources in the conceptual model are denoted by those organisational drivers and strategies employed specifically in a project management implementation environment that achieve organisational performance levels through which competitive advantages are achieved (Ibbs, Wong & Kwak 2001; Din, Abd-Hamid & Bryde 2011; Parker et al. 2013).

Table 2.1 Summary of theory and model applied

	Resources	Innovation and learning	Performance
Resource Based View (RBV)	√		√
(PMPAC) Project management assessment construction model		√	√

Table 2.1 outlines the theories and models with summaries for the variables that supported the research background for this study. The focus of RBV is the range of resources that can be employed to achieve a competitive advantage, in this case the ability to attain increased performance. The PMPAC model concentrates on understanding the interaction between those resources to improve PMP and project success. It is from understanding the relationships that best practices can be employed by organisations to obtain and sustain a competitive advantage.

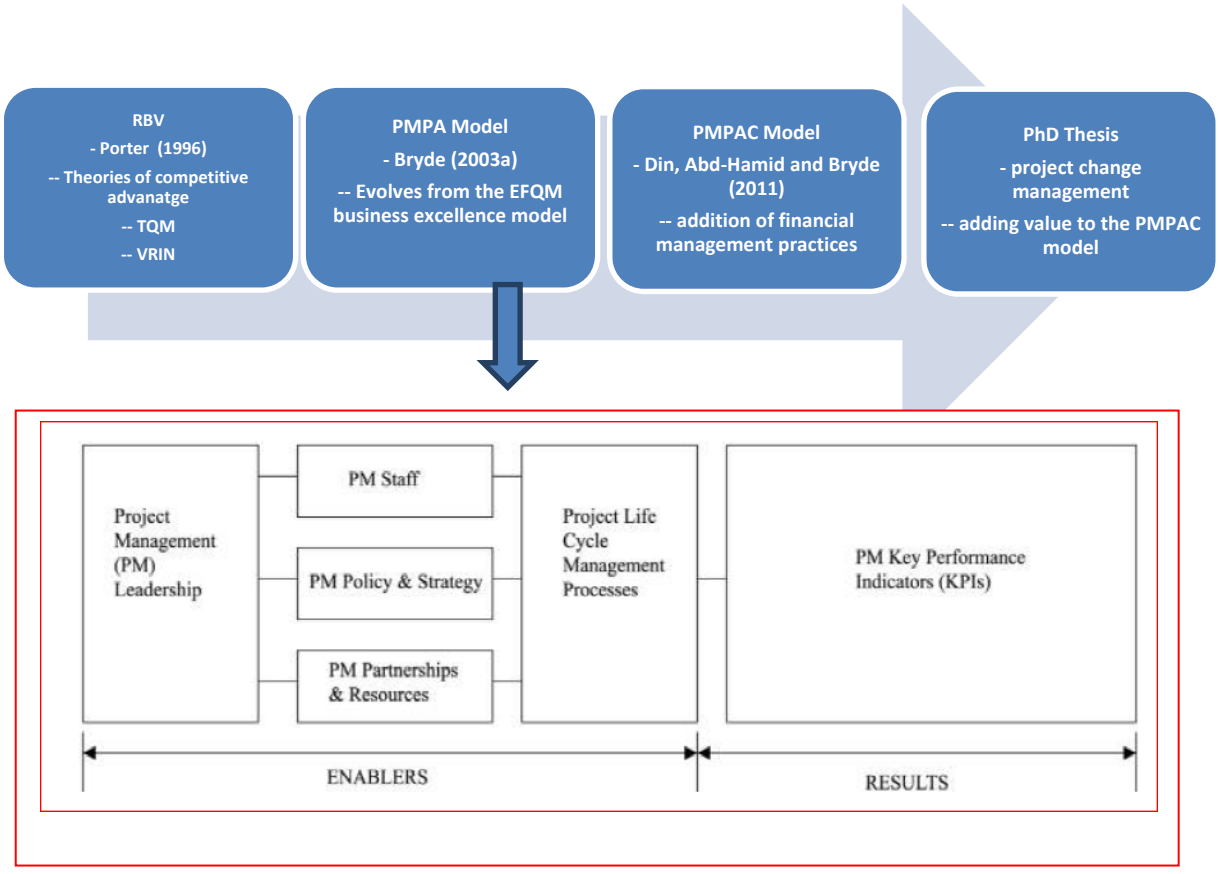


Figure 2.4 The alignment of the theories in this research study

The conceptual flow of the research study is illustrated in Figure 2.4 that shows how the theories in this research align. The interconnection between the RBV theory and the value of strategic management and the utilisation of resources to create a competitive advantage was asserted by Powell (1995) as TQM was seen to provide a sustainable competitive advantage. Tena, Louise and Puig (2001) suggested that the employment of adopting a TQM approach to strategic resources and core competencies could create a sustainable competitive advantage, thereby increasing organisational performance. By employing a the PMPA/PMPAC model and adding the concept of project change management the research undertakes to understand how the variables employed can affect project management performance as a means to determining those that influence project success.

2.2 Resource-based view

2.2.1 Theory behind the research

In strategic management, understanding sources of sustained competitive advantage has become a central area of study (Barney 1991; Porter 1996; Powell 1995; Tena, Llusar & Puig 2001; Cheung, Chan & Kajewski 2010). The resource-based view (RBV) specifies that in strategic management, the fundamental drivers of a firm's superior performance and competitive advantage is largely connected to their resource attributes (Wernerfelt 1984; Black & Boal 1994). Therefore, for an organisation to achieve a competitive advantage, it should seek an understanding of the relative degree of association between performance, competitive advantage, and the firm's internal resources (Barney 1991; Collins & Clark 2003; Majeed 2011; Ismail et al. 2011). This literature review is based on RBV theory as a parent discipline, from which the EFQM business excellence model has arisen as an inevitable reference in quality-related matters and as an efficient tool to measure the capabilities and resources of a firm.

2.2.2 Resource-based view (RBV)

The RBV of an organisation is a promising theory that has emerged in the past fourteen years that provides insights on both organisational and strategic issues. According to Porter (1996) and Barney, Wright and Ketchen (2001), RBV theory was developed with the aim of explaining why some organisations outperform others. Barney (1991, 2002) argued that the central proposition of RBV theory is that if an organisation is to realise a competitive advantage, it must obtain and control valuable, rare, inimitable, and non-substitutable (VRIN) capabilities and resources. In

addition to VRIN, Barney (1991) stated that a firm should have a form of organisation in place that can absorb and apply these resources and capabilities. This statement has been shared by a number of closely related analyses – the knowledge based view (Grant 1996), dynamic capabilities (Teece 2007; Helfat & Peteraf 2003), and core competences (Ghoshal 2005). Barney's approach argued that the key to strategic achievement, not only relies on the environment, but also in the firm itself.

Critics of RBV have identified numerous weaknesses with the theory, pointing out its limitations and offering valuable suggestions that can improve the theory in the future (Lippman & Rumelt 1982; Priem & Butler 2001). For instance, while RBV offers the appropriate application of resources, values, and variables, critics argue that it falls short in its value, resources and that it offers a narrow explanation about a firm's competitive advantage (Priem & Butler 2001; Porter 1992; Williamson 1999). Nevertheless, by identifying weaknesses and adopting RBV strategic resources, organisations can be better positioned to take advantage of business prospects and increase their competitive advantage (Helfat & Peteraf 2003). Mathur, Jugdev and Fung (2013) found that those assets used in project management are sources of a competitive advantage. When those assets are applied with RBV, which has rarely been undertaken to evaluate project management capability to achieve that competitive advantage that there was a direct correlation between the assets employed and achieving a competitive advantage and this can affect project performance (Mathur, Jugdev & Fung 2013).

2.2.3 Antecedents of the RBV

The RBV theory of organisations traces its roots to organisational economics. In organisational economics, theories of compensation and profits were first linked to the writings of Ricardo (1817), and later refined by Schumpeter (1934) and by Penrose in 1959. The three scholars focused on internal organisational resources as the main determinants of competitive advantage. The backbone of RBV, therefore, consists of the earliest concepts of scholars, such as Ricardo in 1821 on the *theory of differential rent*. Over a century later, Chamberlin and Robinson in 1951 and 1953 respectively added to the theory with the *possible significance of some firm resources*, and later Penrose in 1959 contributed the idea that an organisation was an administrative organ that possesses a collection of resources. The history of RBV theory, therefore, implies that some theoretical aspects of an area of human activity are actually known long before they are formally adopted and integrated into academic philosophy.

2.2.3.1 David Ricardo

Looking at each individual contributor to the final formulation of the modern concept of RBV theory was articulated by Birger Wernefelt in 1984. By beginning with David Ricardo a British political economist who wrote about the rent difference that emerge due to the differences in location or fertility of agricultural land. Ricardo's Law of Rent states that the rent of a land site is equal to the economic advantage obtained by using the site for its most productive use. The Law of Rent became the basis of the economic concept of comparative advantage.

In Ricardo's view, the production of the earth has a rent that should be paid to the landlord, and productivity can be viewed in terms of how fertile given land at a specific place was. The same process was also used to describe mines where the quality of labour used in transport and extraction of the product determined the rent to be paid. It is Ricardo's awareness of the economic advantages to be gained due to differences in resource quality, and the potential of having a competitive edge over rivals if one possesses the superior resources (rent differences). Besides this, Ricardo singled out the heterogeneous nature of resources (Ricardo 1821).

2.2.3.2 Edward Chamberlin and Joan Robinson

Other early research efforts into this microeconomic area were made by Chamberlin in 1951. He evaluated consumer choice and competition theory, questioning how they were connected with product pricing. His approach was based on product differentiation and value theory that empowered firms to set high prices as opposed to the condition of perfect competition (Chamberlin 1951). In contrast with Chamberlin's views on perfect competition, Robinson (1953) wrote about imperfect competition with the primary objective being the product differentiation. Robinson noted that markets are not perfect and that there are numerous forms of competition. In view of these, Robinson introduced a number of competitive aspects that scholars agree with today (Helfat & Peteraf, 2003; Teece 2007; Almarri & Gardiner 2014), among them modification of prices, salesmanship, advertisement, differentiation or imitation of products, and introduction of extra services (Robinson 1953).

2.2.3.3 Edith Penrose.

Despite the above observations, the present day literature shows that it was not until 1959 when Penrose laid the key foundations of the RBV theory (Penrose 1959). Subsequent years also saw a

number of scholars developing a theoretical framework that improved on Penrose's approach to develop RBV theoretical foundations of an organisation such as Rubin (1973) and Wernerfelt (1984). Penrose (1959) argued that a firm is an administrative organ and based on the theory of the growth of a firm, she noted that firms could develop capability, skills, and resources over time. Penrose was of the view that the firm's history and employee experience inside the firm could potentially generate profits. A number of scholars have recently confirmed Penrose's contributions to RBV, such as Newbert (2007), Pitelis (2004), and Lockett (2005).

These proponents argue that Penrose made substantial contributions by pointing out that an organisation's resources are usually different, and recognised the fact that one productive resource in a firm that is only available to the firm is entrepreneurial skill. Others agree that the work of Penrose centred on the firm's need to make a profit as facilitated by managers who aspire to grow their profits. Other works by Kor and Mahoney (2004) supported the contributions made by Penrose on RBV theory in four major aspects: economic rents, competitive advantage and isolating mechanism, sustaining competitive advantage, and creating the competitive advantage. However, critics such as Rugman & Verbeke (2002) argued that Penrose was misinterpreted and that her work did not specifically add to RBV theory. Instead, they contend that Penrose's research generated questions that led to RBV.

2.2.3.4 Joseph Schumpeter

Schumpeter's notion of entrepreneurship is paralleled with an organisation according to Gick (2002), whereby the idea of the internal organisational environment having the ability to create new resources. Schumpeter's (1934) suggested that innovation as created by an entrepreneur was akin to organisations who introduce new products or change products by adding new qualities or by utilising new resources in such a way that it reformulates the organisation. According to Schumpeter (1934) the entrepreneur albeit innovation, are essential to economic development processes and integral in leading economic change. Schumpeter's entrepreneurial leadership theory essentially involves adaption and creation of new resources that add value that are the result of a change management approach to organisational strategy.

Despite the above antecedents by Penrose, Chamberlin, Robinson, Schumpeter and Ricardo, two additional antecedents have been discussed by Barney and Arikan (2001). One is the anti-trust

implication of economics and the other is distinctive competencies. Distinctive competencies have been studied for many years and gradually linked with the question of why some organisations perform better than others do. Porter studied this question in various studies (1979, 1980, and 1985). According to Barney and Arikan (2001), distinctive competency indicates features, which support approaches to business in a highly effective and efficient manner compared to other firms. The authors emphasise internal firm capabilities that generate the required differences to boost a firm's competitive advantage, such as the abilities and skills of leaders, the history of the firm's entrepreneurs, and the general management capacity. From a different perspective, the second antecedent of anti-trust implications has been reported to promote social welfare and in return maximise the firm's competitive edge. As a result, a number of techniques have been employed by Barney and Arikan (2001) to explain how implications for welfare are developed while enhancing competitive conditions for firms, thereby forming early contributions to the RBV theory.

2.2.4 Early contributions of RBV theory

The contemporary work on RBV theory began by Wernerfelt (1984), as asserted by scholars Rumelt (1984), Dierickx and Cool (1989b), Reed and Defillippi (1990), Barney (1991) who further attested to this notion. According to Wernerfelt (1984), resources and products are the two different sides of the same coin. His research centred on the relationship between resources and profitability, taking into account resource strategies. His findings indicated that resources could be intangible; in addition, tangible assets can also be linked in a semi-permanent manner to an organisation.

Porter (1980) and Wernerfelt (1984) introduced five competitive powers with the aim of explaining an organisation's activities. Put simply, the five competitive forces were designed by Porter (1980) who identified the model as the five-competitive force model. This indicated a framework that could be used to scrutinise other competitive powers, and the model has proved valuable for industrial business and analysis strategy development. Porter's (1980) five forces have been identified as:

- a rivalry between competitors
- the negotiation with customers
- the negotiation with suppliers
- substitute products
- the threat posed by new competitors.

RBV advanced under Peteraf (1993) asserted that competitive advantage could be sustained when the use of inimitable technological resources are deployed to achieve lower production costs. In the context of project management, this might well be construed as the utilisation of an asset that decreases material or supply costs. Peteraf (1993) furthered the research of Wernerfelt (1984) by designing a new model that looked to identify how organisations could achieve a sustainable competitive advantage with four cornerstones: Heterogeneity, Ex post barriers to competition, Ex ante barriers to competition, and Immobility. Just as Peteraf (1993) considered the theory of competitive advantage of RBV, by 2003 Peteraf and Barney (2003) extended this view to value creation. Wernerfelt (2003) noted that the production function, whereby the employment of resources (inputs) and the output generated is possible for any organisation. This belief holds that the employment of resources is in fact optimal, in that they are employed to capacity and used to the best advantage, which is not always the case. Foss and Foss (2004) that this is a limitation of RBV, in that it does not account for the fact resources are employed optimally.

Today, the theory has been applied in various non-strategic management areas, such as operations research, marketing, and human resource management (Almarri & Gardiner 2014). It seeks to clarify why the internal resources of a firm are central to promoting its competitive advantage. In Wernerfelt's (1984) early analysis was focused on strategic advantages that organisations possess when choosing resources. The importance of generating some barrier forms was identified and grouped into three categories: including mergers and acquisitions, attractive resources, and first mover advantages.

First mover advantages

The early RBV contribution to firms emphasised the importance of enhancing first mover strategic advantage. First mover advantage has been noted to be a resource position hurdle, whereby some organisations possess particular assets. In addition, organisations that possess these assets have a cost advantage because the firm does not need to spend any money to secure them (Wernerfelt, 1984). The fact that other competitors need to find extra time and money to achieve the same resources, provides an immediate barrier that inhibits the activities of the competition while giving the first mover a genuine advantage.

Attractive resources

Attractive resources are made up of different forms of resource. It is possible that firms can obtain the required information about the type of barriers as they identify their classes. Since some resources are more attractive, it is more difficult for other firms to obtain them from the supply chain (Helfat & Peteraf 2003). Therefore, the firm's stockholders have the potential of getting higher profits. In order to understand this strategic resource advantage, Wernerfelt was quick to elaborate with empirical findings observed from technological labs, production experience, customer loyalty, and the capacity of the machines.

Lastly, another hurdle faced by firms is acquisitions that empower an organisation to secure resources that are relevant to the activities which other firms have (Wernerfelt 1984). The acquired firm is ostensibly totally removed from the competitive field of play, but in fact, its resources provide a competitive advantage to the firm initiating the takeover and the new entity is stronger than both the original organisations. Mergers and acquisitions can provide great competitive advantage to an emerging entity that acquires the necessary resources before other businesses in the competitive space.

From the early RBV contributions, it is apparent that most efforts were centred on issues pertaining to position barriers. Their deliberations led scholars to agree that the most appropriate position that organisations could hold was to try to improve on the three barriers, and by doing so gain a competitive advantage on their rivals.

Additional studies on RBV theory identified other, competitive advantages, such as Barney's (1986b) examination focused on studies by Ricardo (1921). The concept of extraordinary rent was introduced as a strategic market factor, making it a place where organisations could secure their resources. Barney (1986) reasoned that this market factor ought to be considered as an imperfect tool that allows organisations to access more than their normal profits by seeking advantage through their position in the market, for example, by lobbying governments or legally reducing taxation or obtaining subsidies. It is critical in these circumstances to comprehend that the success of the strategy relies on the costs involved in obtaining these advantages and the type of strategy applied.

To solve the problem, two suggestions were given if a firm was to secure normal rents. The first is when an organisation acquires resources that are underestimated in their value and enhances its strategic factors, then later are transformed into greater profits than initially expected. The second is the luck factor where organisations anticipate securing some amount of profit from how they use resources in their strategies, and in return, gain more than anticipated. Thus, it is clear that the firm's culture is the source of its sustaining advantage.

Asset reputation

This analysis and the importance of RBV theory in management were further advanced by the work undertaken by Dierickx and Cool (1989). They elaborated on the idea of firms opting to apply strategies, resources, or products based on the concept of opportunity-cost analysis. Among the concepts in this model is *asset reputation*. As a result, the RBV theory was further divided along the lines of non-trade assets and trade assets. Other scholars also argued that a firm's competitive advantage is linked with non-trade assets.

This implies that the RBV is critical when applied to trade assets. Hence, it was adequate for Dierickx and Cool (1989) to propose an alternative theory they termed asset-stock when it comes to non-trade assets. In elaboration, the authors clarified that it is largely expected that an organisation is likely to build on non-trade assets as compared to selling or buying them in the market. In summation, the RBV theory as applies to this case shows that an organisation usually requires a prolonged period to build up a stock of non-tradable resources.

2.2.5 Further contributions to RBV

By the 1990s, the RBV theory of a firm had become prominent enough to permit specialised studies in management journals that were edited by Jay B. Barney in 1991. In 1991 and 1995, Barney built upon the earlier contributions to the literature by extending them to explain how an organisation could attain a competitive advantage because of their development capabilities and selection of strategic resources. This approach empowers organisations to apply the necessary approaches to improve their market position. The 1991 articles helped establish capabilities and resources critical for comprehending the firm's sources of sustained advantage. In addition, this RBV contribution further helped delineate capabilities and resources as bundles of intangible and tangible assets, taking into account factors such as the firm's routines and processes, the firm's

management skills; and the knowledge and information it controls that can be deployed to help adopt and implement competitive strategies.

Within the context of the entire theme identified by Barney (1991), a number of diverse publications centred on outlining the essential tenets of RBV theory. RBV evolved as a new theory of organisational management (Conner 1991) by considering the firm's identity as a source of its competitive advantage (Fiol 1991), and diversification and resource utilisation (Harrison et al., 1991). Therefore, the 1991 framework appeared to have changed the introduction phase of the RBV theory into the growth phase.

As it emerged, the RBV started to examine the link between the firm's internal characteristics and its performance. This was based on two approaches. First, firms in a similar industry can regulate strategic heterogeneous resources. Second, these resources do not necessarily exist in mobile situations, but can transform inelastic supply across the nation, assuming that heterogeneity can last for long periods. As clarified, it becomes apparent that the concept of scarcity is linked with excess demand over supply. It can also be stated that it is difficult for some firms to find cheap resources that they can substitute in an effort to employ similar competitive strategies as their rivals.

Further RBV research in 1992 and 1993 showed landmark development in delineating key elements of RBV (Mahoney & Pandian 1992; Kogut & Zander 1992; Peteraf 1993; Amit & Schoemaker 1993). Subsequently, by 1996, RBV was sufficiently developed to fuel the winning paper awarded annually by the Academy of Management Journal (Miller & Shamsie 1996). By the year 2000, RBV theory had become prominent to a point of attracting significant criticism from Priem and Butler (2001, 2002).

Later, Lippman and Rumelt (2003) initiated research on the micro - foundations of RBV, during which they introduced the perspective of payment of a firm's resources. A similar study by Ireland, Hitt and Sirmon (2003) assessed profits that entrepreneurs can generate by utilising factors needed to exploit growth opportunities with an aim of creating and sustaining competitive advantage. Gavetti (2005) explained and introduced the theory of micro-foundations of dynamic capacity and the importance of hierarchy and cognition.

The micro-foundations and the nature of RBV were further researched by Teece (2007) as capabilities that could sustain a firm's performance in an open economy with globally diverse sources of manufacturing, innovation, and invention. Additional studies by Crook et al. (2008) deployed meta-analysis in ensuring strategic resources to explain the significant portion of the variation in performance across extant evidence. The merits of prominent criticism have also been considered by Kraaijenbrink, Spender and Groen (2010).

2.2.6 VRIN (valuable, rare, imperfectly inimitable, non-substitutable)

The first theoretical tool of RBV that was explained is believed to have been by Barney (1991). Scholars agree that to gain a competitive advantage and create resource sustainability, a firm's resources must be valuable, rare, inimitable, and non-substitutable (VRIN). This implies that a firm's competitive advantage is created when it establishes a higher economic value compared to that which its marginal competitor makes. In comparison, Peteraf and Barney (2003) suggested that a competitive advantage originates from the availability of critical resources, which are utilised in a more advanced manner. The superior utilisation of resources is directly associated with how a firm's resources can be transferred into competitive advantage.

Mathur, Jugdev and Fung (2013) specifically examined project management assets as measured against project management performance outcomes in regards to those that are valuable, rare, and inimitable and have organisational support in order to achieve a competitive advantage. Specifically as to project management performance, they found that those factors that pertained to it were those traditional measures of cost, quality and time, along with scope and the expectations of customers (Mathur, Jugdev & Fung 2013). What Mathur, Jugdev and Fung (2013) achieved was to prove the tangible relationships between valuable, rare, inimitable assets and project performance. Furthermore, it showed the causal connection and need for organisational support as variable in order that assets can contribute to the project management process in achieving project outcomes (Mathur, Jugdev & Fun 2013).

If VRIN resources are not managed by persons who are skilled and able to make appropriate use of the resources, and assess their benefits and/or usefulness, it is difficult for the said resources to be of any benefit to the organisation (Nathaniel, Line & Runyan 2014). Delivery of benefits requires

that an organisation's internal resources can be translated into the expected competitive advantage by a member or groups members in the firm. Such talent is in itself a valuable resource.

While researching the development of the RBV model, Barney (1991) argued that the firm's VRIN characteristics should be exploitable by the company's organisational processes. According to Barney, Ketchen and Wright (2011) VRIN provides the necessary capability and resources to transform resource supplies during inelastic conditions, improving the competitive advantage of a firm. As a result no matter how much an organisation is willing to pay for the resources, their supply is largely limited.

An inelastic supply is a powerful indicator that a firm's capability and firms often require time to adjust their resources to meet market demands, and secure demand versus supply equilibrium. In other words, in the short term, it is difficult to meet the necessary market demand, and the assigned resources may demand an extended period to generate. These resources fall into a number of categories, such as having the necessary skills that a market requires for success. It is possible that markets will increasingly compensate persons who are more skilled and can possibly increase the supply and demand; however, the processes may take some time (Almarri & Gardiner 2014). In line with the European quality model, VRIN is a clear indicator of the interplay between capabilities and resources.

The EU Foundation for Quality Management (EFQM) strategy utilises the RBV model as an inherent theoretical foundation. The criteria correspond to the relevant capabilities and resources of a firm. However, the criterion strategy and policy of the EFQM model are never linked directly to a specific resource, though its connection with management capacity is elaborate. Apart from being used as an indispensable reference model for quality related functions, the EFQM model can be utilised as an effective tool to measure the firm's capacity and resources. Therefore, it can be said that the four VRIN characteristics allow capability and resources to be transformed into an advantage that is competitive to a firm and that make its competitiveness sustainable in the market.

Value

Like the RBV, the EFQM can track the primary resources of an organisation in such a manner that a firm can identify the essential parts of a business resource that produce a firm's competitive advantage. However, the four VRIN characteristics have been broadly elaborated in the relevant

literature over time. Firstly, valuable resources have been elaborated as the first characteristics by various scholars. According to early definitions by Barney (1991), valuable resources can allow an organisation to improve its production and as a result become more effective and efficient. These enhanced features can further be transformed into high returns for a firm.

Rarity and inimitability

The second characteristic of capability and resources, rarity, there is the implication that it will be a little difficult for another firm to develop similar success strategies because of the rarity of the resource. The inability to access these resources implies that the firms cannot gain the needed advantage to compete with the first firm to have access to the resources (Ghoshal 2005). The third factor inimitable resources emerged as a complement of the first two factors (rarity and value). They are regarded as an imperfect inimitable resource.

Cheung, Chan & Kajewski (2010) pointed out that rarity is a causal ambiguity that appears where there is an elaborate link between sustainable competitive advantage and the available resources. The success of an organisation and the resources available to a firm has a complex connection. Imitating another firm's success strategies can be time consuming and be a more difficult undertaking that may not be possible if one does not have all the required information.

The third VRIN characteristic indicates that other organisations cannot be in a position to imitate the same resource (Kraaijenbrink, Spender & Groen 2010). Teece (2007) has discussed various explanations for non-imitability, such as non-substitutability, social complexity, causal ambiguity, and unique historical conditions. Petals (2004) observed that the firm's unique history could be determined by its performance success and lead to greater success. Possession of rare and valuable resources by an organisation relies on the firm's history that cannot be imitated by competitors since the firm may have acquired the resources over time.

Non-substitutable resources

The fourth VRIN factor associated with RBV is the non-substitutable nature of the firm's capabilities and resources. If the business controls a valuable resource for which there is no equal replacement or substitution, it commands an exceedingly strong strategic position. Often this resource is something unique and irreplaceable, like Steve Jobs for Apple computers or even the Apple brand name, or a geographical location, like the Lords Cricket Ground in the UK. Nothing

can stand as a substitute for something regarded with so much awe and reverence as these two resources.

Killen et al. (2012) explained that non-substitutability is a socially complex issue. Some capabilities and resources that involve social relations in organisations cannot be imitated by other firms since other firms do not have the same mix of employees. Some factors largely rely on the organisational culture. In recent years, Barney and Clark (2007) elaborated more on the concept of substitution of resources taking into account the social complexity, causal ambiguity, and the history of a firm and the likelihood that a firm can copy capabilities or resources from a different firm. Organisational culture, skills, and facilities can largely be acquired or generated by organisations over a period of time, and are made up of critical resources that rely on resolutions that firms undertake as they evolve. While it may be simpler and more cost effective to copy another firm's capabilities or resources, and firms will do this where they can, often it is just not possible to be what you are not, and each firm will have its own evolutionary history – for better or worse. Of course, no part of the VRIN will assist a firm if the firm is not in a position to use its available resources and capabilities (Barney & Clark 2007) or if it is lacking a critical resource at the ideal time for its deployment. However, if the firm is in a position to exploit its available strategic resources, it is important to identify all the resource characteristics at its disposal.

Despite the above elaborations, some scholars have argued that VRIN as a resource characteristic has been less studied from an empirical perspective (Newbert 2007; Crook, et al. 2008). Moreover, the RBV dependent variable, which is the firm's competitive advantage, though broadly discussed in strategic management, has not yet been defined in definite terms. In other words, the terms competitive and performance advantage are usually used as substitutes. Even so, the value of resources depends on the capacity of a firm to neutralise possible threats and as a result, empowers a firm to exploit opportunities that come up because of business environments, which is to imply that resources are important if they enable an organisation to implement and design strategies that improve its effectiveness and efficiency. As Barney, Ketchen & Wright (2011) pointed out; in volatile situations only the VRIN, resources can assist the company to be a market leader by providing a competitive advantage.

While RBV considers strategic management and a broad collection of resources employed internally within the organisation. This could be conceived as a macro view of those resources from an internal perspective. Some of those resources may not have a strategic significance. In order to be employed strategically to gain a competitive advantage only those resources that have specific characteristics can add value those that are VRIN.

2.2.7 Development of RBV theory

Until the 1980s, RBV was largely described by its fragmented processes of development as opposed to the modern unitary whole as discussed in previous sections. As noted, the early acknowledgement of the potential RBV development can be traced back to the 1950s in the research works undertaken by Robinson (1953) and Chamberlin (1951). Instead of emphasising market structure, the three economists (Penrose, Robinson and Chamberlin) pointed out firm heterogeneity of organisational resources and proposed that unique capabilities and assets were critical issues that gave rise to imperfect competition and the achievement of high profit returns. Heterogeneity became one of the four cornerstones Peteraf (1993) devised in an adapted model based on Wernerfelt (1984) to determine competitive advantage. Chamberlin (1951) recognised that some central capabilities of an organisation included the actual talent in the firm that made it capable of smart, decisive action, brand awareness, reputation, and the technological expertise of managers and its trademarks and patents.

The most contentious work in the history of RBV development occurred when Penrose researched the theories of firm growth. Penrose (1933) gave the most detailed exposition of RBV in current management economic literature. Penrose's (1933) research findings reported that a firm is more than an administrative centre, possessing a collection of productive resources, which can be used in a firm's disposal to give it a competitive advantage. Penrose's (1933) findings remained lone findings for long periods in economic literature as some economists down played and denied her conclusions. Others failed to establish any relationship between the extent of the branches of an organisation and the RBV theory of management, as in the case of the neo-classical perfect condition argued by Bain (1991). However, a notable exception by Daft (1983) married the idea of routines and knowledge of a firm similar to findings by Schumpeter (1934). At this point, it was understood that a firm's competitive advantage could be understood in terms of the practical hierarchy of an organisation and its routine that can define its' skills. However, with the first work

by Wernerfelt (1984), the concept of RBV theory in organisational management was officially accepted in the current literature.

After Wernerfelt (1984), debate was sparked in the 1990s when Barney (1991) presented their articles in the seminal work on the RBV theory. At the beginning of the millennium, there were heightened activities around RBV theory with major papers being published to evaluate the contributions of RBV into management theorising. Considerable work in this discipline exists and continues to be researched, perhaps indicating the growing impact that the theory has had throughout its' evolution. There is a growing interest in firm specific resources and capabilities and the amount of research, publication and discussion has flourished. Growing amounts of management literature report a number of cases where firms with the right resources have outperformed their competitors (Almarri & Gardiner 2014; Nathaniel Line & Runyan 2014).

2.2.8 RBV within the project management context

The advancement of the Bryde (2003a) model from the EFQM model looked to explain relationships between variables (Qureshi, Warraich & Hijazi 2008; Rehman, Usmani, & Al-Ahmari 2012; Mir & Pinnington 2014). It follows that there is a need to understand the best means by which to utilize those resources employed within a project and organization (Langston 2013; Cullen & Parker 2015). The EFQM model looks to recognize those areas within the organization that has critical resources as a means of achieving a competitive advantage (Ignacio, Ruiz-Carrillo & Fernandez-Ortiz 2005). In order to achieve this it is necessary to employ an organizational theory such as RBV as was achieved by Ignacio, Ruiz-Carrillo and Fernandez-Ortiz (2005). They proved that the EFQM could be used as an efficient means to measure those resources and the potential capability when employed within an organization (Ignacio, Ruiz-Carrillo & Fernandez-Ortiz 2005). By employing RBV as an implicit theory, it enabled them to analyse the main resources needed to achieve that competitive advantage.

Jugdev (2004, p. 23) noted '…in applying RBV to project management, researchers and practitioners can better understand the connections between project management and strategy as well as the project management characteristics that contribute to competitive advantage--information that can help professionals acquire the knowledge needed to develop the frameworks upon which they could build project management theories'. Jugdev (2004) considered RBV from

the project management perspective given RBV's internal perspective, as those assets are integral and unique to the organisations existence and create the competitive advantage. Jugdev in 2003 postulated the idea of PM as an asset, as well as, how PM could be used to maintain a competitive advantage (Jugdev 2004). RBV has been shown to provide a framework that can identify groupings of variables in a logical manner and how these variables now relate to a larger construct (Jugdev 2004). Jugdev (2004) held that by using the RBV theory as a framework there could be greater understanding and knowledge development within PM. By applying RBV to PM a clearer understanding of those characteristics can be achieved, thereby improving the understanding of the correlations between PM and strategy and as a means to adding value to achieving a competitive advantage (Jugdev 2004).

RBV has been widely adopted by project management managers especially when customised within specific contexts (Almaari & Gardiner 2014). Besides the value RBV provides in explaining the relationships between variables to increase the utilisation of an organisations resources to maximise its capabilities to realise their full potential, RBV theory is considered the first to find that PM resources are a basis of competitive advantage (Almaari & Gardiner 2014). Furthermore, RBV has been shown to provide organisational success (Barney 1991, Peteraf 1993, Foss & Knudsen 2003). RBV has been able to both tangible and intangible assets that include organisational processes, managerial skills of staff and how it utilises knowledge and information to in a strategic way to achieve a competitive advantage (Barney, Ketchen Jnr. & Wright 2011). RBV over the past two decades is regarded as a leading theory that enables organisations to understand, explain and predict relationships between resources (Barney, Ketchen Jnr. & Wright 2011) and according to Kraaijenbrink, Spender and Groen (2010) RBV still holds merit.

While RBV is fully accepted and warranted within the organisational and strategic management contexts, it can still be considered in its infancy within project management arena as there is 'an emerging interest in the application of the RBV perspective' (Mathur, Jugdev & Fung 2013). The intangible PM resources that are considered rare and inimitable are those that contribute to a competitive advantage (Mathur, Jugdev & Fung 2013). Within the PM context, intangible resources include sharing tacit knowledge and those processes involved in disseminating that knowledge along with the relationships associated to it and this rarity contributes to creating a

competitive advantage (Mathur, Jugdev & Fung 2013). Mathur, Jugdev and Fung (2013) contend that an organisation's RBV (those resources that are valuable, rare and inimitable) as project management assets will dictate PMP outcomes as a means to contribute to a competitive advantage, when they are supported by the organisation. When considering project management performance outcomes the measures for project success were deemed traditional, as in the iron triangle, as well as project scope, and customer expectations (Mathur, Jugdev & Fung 2013). The factor comprising firm-level performance pertains to the traditional measures of firm competitive advantage, such as sales targets, customer loyalty and satisfaction, profitability, market share, and innovation (Mathur, Jugdev & Fung 2013).

Cullen and Parker (2015) contended that the organisations employing RBV should look to enhance their project managers and teams' skills and capabilities to increase resource value and to increase likelihood of project performance and success. Similarly, by adopting RBV this will increase informed decision-making when evaluating strengths and weaknesses of those resource-based assets and potential capabilities (Cullen & Parker 2015). Therefore, RBV can provide valuable insight into improving project managers, project teams and thereby affect project management performance. RBV can serve to intervene in the management of project resources and strategic assets by decreasing dependencies and unknown factors (Cullen & Parker 2015).

2.2.9 Summary

As discussed, from a theoretical point of view, the basic premise of RBV theory seeks to address the essential question of why some organisations are different from others, and how firms sustain and achieve competitive advantage over their competitors.

In the last five decades, a number of management scholars have contributed a series of development findings to this debate (Wernerfelt 1984; Barney 1991; Kraaijenbrink, Spender & Groen 2010); Mathur, Jugdev & Fung 2013; Cullen & Parker 2013). Individuals like Robinson and Chamberlin are considered pioneers of RBV theory, while others accord credit to the works of Penrose in 1959. However, it was not until 1984 when Wernerfelt indicated the importance of RBV as a key factor in promoting the firm's competitive advantage that RBV became more universally noted by scholars in the field.

It has now been acknowledged that it is the heterogeneity of productive services that a firm possesses that account for its unique character as opposed to homogeneity of resources. Therefore, the conception of an organisation's resources forms the basis of the RBV (Wernerfelt 1984). It is clear that evaluating organisations in terms of capability or review can potentially result in new information that is different from traditional perspectives. With time, a more comprehensive and concrete framework has been identified by Barney (1991, 2001) related to the resources that can generate a sustainable competitive advantage for a firm. The current identified resources have been bundled together into the VRIN framework that includes the concepts of value, rarity, inimitability, and non-substitutable resources (Barney 1991). A number of scholars (Dierickx & Cool 1989b; Amit & Schoemaker 1993; Rumelt 1991; Peteraf 1993; Mahoney & Pandian 1992; Barney, Wright & Ketchen 2001) have embraced, as well as expanded, on views expressed by Barney to incorporate the idiosyncratic nature of resources, non-tradability, and resource durability.

2.3 Defining project success

The discussions over the past three decades have focused on project success have led to a broad array of interpretations. They have continually evolved from the fundamental grounding of the iron triangle (time, cost, quality) proposed by Barnes in the 1960's to measure the success of a project to the more complex model-based measure proposed by Bryde (2003a) (Toor & Ogulana 2010; Meng 2012; Mathur, Jugdev & Fung 2013; PMBOK 2013; Cullen & Parker 2015). De Wit (1988) found that project success was dependent upon how it was assessed against the project objectives, including the iron triangle and the project mission. In defining project success, much like organisational success, a logical framework has been suggested as a means to both understand and analyse project success (Porter 1980; Barney 1991; Baccarini 1999; Jugdev 2004; Langston 2013). Baccarini's (1999) framework stated that project success should be measured by evaluating both input and output goals while considering three components – the constraints of cost/time/quality, coupled with the quality of project management processes and the realisation of project stakeholders' expectations. Langston (2013) held that the notion of what project success is muddled, and yet despite continued discussions that challenge the traditional iron triangle, there is emerging sentiment to establish a 'new paradigm. This is grounded in the definition of the terms from, project management success, success factors, project success, and success criteria and that

the regulatory body must be held accountable for not addressing this ambiguity, as they focus solely on the discipline practice and procedural requirements and not on ratifying a clear definition.

This lack of clarification has left industries exposed and uncertain as to what is meant, as well as to whether they should adopt PMP methodologies. In specific industry sectors, those organisations that are able to clearly delineate and evaluate project management are more likely to attain project success (Thomas & Fernandez 2008). However, organisations still disregard the need to invest in the assessment of PMP (Qureshi, Warraich & Hijazi 2008). Rehman, Usmani and Al-Ahmari (2012) pointed out that organisations that employed a PMP evaluation model realised substantial benefits as to overall performance. Exactly what constitutes project performance has been broadly reviewed by researchers, whose results have focused on the causality of project outcomes, good or bad, which has differed between projects (Fortune & White 2006; Thomas Tang & Palaneeswaran 2009; Sauser, Reilly & Shenhar 2009; Patanakul & Shenhar 2012).

Given Saudi Arabia's project failure rates, there is a need for project management performance (PMP) models. A model built on numerous case studies and tailored for the Saudi Arabian region taken from a broad spectrum of models across industry sectors would prove invaluable. This would increase understanding of the attributes that are affecting project outcomes, as this would provide valuable insight into areas where there is too little information, while contributing to improving project performance.

By solely considering project failures within particular industries, it is possible to overlook or be unintentionally selective when considering existing models since in a single industry sector most projects are likely to be similar (Sharma 2009). Only by undertaking an exhaustive broad assessment that considers data from a wide range of industries, will the investigation yield greater information as to how to build on existing theories and integrate ways of evaluating PMP beyond the traditional measurements of KPIs like cost, timeliness and quality specifications (Ali & Rahmat 2010).

2.3.1 Perceptions of project value

This study problem is underpinned by the need for a new PMP measurement that can be applied across all industry sectors and address specific barriers, while yielding new theories that can enable all stakeholders to fortify this emerging field and discipline in Saudi Arabia (Reiling 2008). The

continual failing of projects across all sectors has raised the issue that despite advances in project management systems, project outcomes have not improved, which has raised concerns over the perception of project value (Mir & Pinnington 2014). These issues have been seen by some as a reason to judge projects using PMP since previous methods and processes have not yielded universal positive outcomes (Thomas & Mullaly 2007). Fortune and White (2006) noted that PMP success is a result of senior management having a clear vision and providing sufficient support for the project, including guidance and feedback as to expectations.

In organisations undertaking projects, senior management must oversee both the project implementation performance and project management aspects simultaneously, and much of the project's success or failure depends on their skills. Regardless of flawed management processes, some projects will succeed, while others fail in their mission, goals and indicators in spite of management processes that were approved when modelled (Taylor & Ford 2006).

Another issue common in the realm of project management is the evaluation criteria, which have been less than standard on many occasions (Taylor & Ford 2008). For instance, it is common for staff in any organisations undertaking key projects to claim that a successful project can be achieved, even when the key performance indicators (KPIs) are not realised (Shenhar et al. 2001). These project management experiences point towards a subjective regime of evaluation where criteria skew towards psychosocial attributes rather than the actual PMP (Tukel & Rom 2001).

In the past, organisational focus on project implementation performance has been identified with specific aspects of costs savings (Yates & Eskander 2002) and completion deadlines (Razek, Bassioni & Mobarak 2008). Ali, Al-Sulaihi and Al-Gahtani (2013) and Mir and Pinnington (2014) have called for increased research into other aspects of project performance and a focus on KPIs. Most studies in the last two decades have predominantly concentrated on project success attributes based on simple models (Shenhar et al. 2001) without regard for project complexity. This had led to a lack of consensus about the best criteria for evaluating project successes (Tukel & Rom 2001). However, current project management research and experience is encouraging firms to incorporate multiple attributes as a means by which to measure success. Therefore, significant attention has been focused on PMP modelling to complement the traditional focus of project performance – quality, time, and cost – that has been recognised as too narrow in the modern context of megacities and resource depletion (Bryde 2003a).

Recent studies by Din, Abd-Hamid and Bryde (2011), Rehman, Usmani and Al-Ahmari (2012), Ali, Al-Sulaihi and Al-Gahtani (2013) and Mir and Pinnington (2014) have all sought to expand on previous research using Bryde's (2003a) model by looking at discrete aspects of PM performance. These studies have moved beyond what Bryde (2003a) observed, in that some researchers' models were designed to enable firms to use PMP to gain a competitive advantage, irrespective of project success or implementation. Furthermore, Bryde (2003a) notes that some researchers have been keen on PMP that influenced the final attributes of the project irrespective of the KPIs. In these instances, PMP itself is a means rather than an end for the project.

In the context of construction projects, project performance is judged during various phases, which justifies the importance of having a quality management system (QMS) in place for the purpose of maintaining due diligence (PMI 2013a). Additionally, one aspect of project performance is based on its appropriateness as it relates to stipulated guidelines imposed by contractors, thereby ensuring convergence towards a goal (Goff 2008). Another way to view project performance was assess project performance based on customer approval of the quality functions (Chan & Tam 2000; Soetanto & Proverbs 2012).

Value, of course, can be ensured only if there are clear expectations as to how project performance will be used and what it will measure. The number of methods for conducting and assessing project performance has resulted in the adoption by some managers of a standardised approach (Hill 2013). Consequently, in various industries, the International Standard for Organization (ISO) 9000 has gradually been adopted to assess project performance (ISO 2010; Leong et al. 2014). However, challenges remain in the construction industry in terms of testing performance because different projects phases do not have the same practices (PMI 2013a).

In any project, it is imperative to assess the performance and ensure that all the specifications and targets are achieved (Goff 2008; Bible & Bivins 2012). Consequently, various PMP assessment (PMPA) models are often deployed (Qureshi, Warraich &Hijazi 2008; Din, Abd-Hamid & Bryde 2011, Rehman, Usmani & Al-Ahmari 2012; Ali, Al-Sulaihi & Al-Gahtani 2013; Mir & Pinnington 2014). For example, a quality management model, such as ISO 9000, can be implemented alongside the European Foundation for Quality Management (EFQM) in any firm seeking organisational excellence (Barad & Raz 2000; Fonseca 2015).

However, there is significant evidence as to the perceived value of the use of ISO 9000- based QMS in the construction sector (Zeng et al. 2005; Ng, Palaneeswaran & Kumaraswamy 2008; Din, Abd-Hamid &Bryde 2011). In some cases, there was hesitation to implement ISO 9000 associated with costs, and only after achieving a cost benefit analysis was there a belief as to its inherent value (Ng, Palaneeswaran & Kumaraswamy 2008). This attitude also held true for other systems that were considered by clients. In spite of these doubts, ISO 9000-based QMS exhibits extrinsic benefits when put in place, including the reduction in costs and improvement of managerial systems (Ng, Palaneeswaran & Kumaraswamy 2008). The issue with this system and the perception is that the defining value is solely perceived in terms of financial gain over the cost to implement and it is that which denotes quality and value.

How then terms like quality are defined by each project will depend upon stakeholders for every project. Thus, determining a standard by which projects can be measured extends to how certain key terms such as 'quality' are not only defined but also interpreted, although there are always some generic considerations such as total quality management (TQM) and ISO's definition (Adenbanjo 2001). Whatever the interpretation, it is essential that the definition and value of what is deemed quality are clearly defined and connected to the project's stipulated goals (Dale et al. 2000; Brobera & Trninić 2006).

2.3.2 Performance measurement value

The next significant measure for evaluating PMPA models is to ascertain the appropriate project activities, while the other is to refine the results of the projects to specific and measurable outcomes, such as timeliness and other values (Bryde 2003a). Essentially, most project managers are keen to assess performance over a given period, so that specific adjustments can follow whenever there is non-conformance or when metrics fall out of specifications (Fayek, Dissanayak & Campero 2003). These performance measures can be tangible or intangible and depend on the project-monitoring plan. Often, the success of any project is based on its ability to deliver according to specifications (Humaidi & Asarani 2012). Furthermore, the achievement of these project performance criteria depends on the goals and dynamics, such as challenges within the entire life cycle (Shenhar & Dvir 2007; Kendrick 2010; Qureshi, Warraich &Hijazi 2008; Mir & Pinnington 2014).

The significance of PMPA has increased in the past two decades as projects pursue more unique goals (Kendra & Taplin 2004; Kang 2011). Features of PMPA that take on various levels of significance include the completion of projects on time (Kerzner 2013), adherence to the project budget (Kim & Ballard 2001), and conforming to quality guidelines (Kazaz & Birgonul 2005). When these three dimensions are combined, most organisations tend to consider that performance has met expectations (Lu et al. 2010). However, some studies speculate that there is a balance among the PMPA values, like the cost of operations, realistic time frames and the performance quality, which tends to create false optimism, which is rarely the case all the time (Muller & Turner 2007; Newell 2002). There exists a need to measure and validate all PMPA models, as evident in extensive literature findings and theories in related disciplines (Parker 2000; Pinto & Morris 2004).

Various studies have shown the value of project quality and its significance (Stevens 1996; Erdogan et al. 2005; Goff 2008; Masters & Frazier 2007; Mir & Pinnington 2014). This includes the understanding of the term 'quality' in the context of projects (Din, Abd-Hamid & Bryde 2011), as well as how organisations and customers perceive PMP (Fayek, Dissanayake & Campero 2004). Dissanayaka et al. (2001) noted that many organisations are striving to satisfy stakeholders' expectations in multiple projects, which demonstrate the further significance of PMPA, and there is consensus among different researchers about the significance of PMPA in the broad sense of quality in projects (Tukel & Rom 2001).

Following past project failures, there has been a growing emphasis on PMPA as to quality with adequate justification. In each case, the purpose of PM has been to demonstrate to the customers that certain standards were adhered to during project implementation (PMI 2013a; BSI 2000). This position conforms to the conceptual understanding of quality and its implementation to meet customer specifications (Oakland 2000).

2.4 Project management

Project management has become a common term, especially over the past few decades due to its role in the achievement of project goals and objectives. Project management during implementation refers to the process of controlling the accomplishment of the project goals and intended use (Gido & Clements 2014). Utilising existing organisational structures and resources, project managers identify ways of managing the project by evaluating a collection of tools and

techniques in carrying out project work. The main functions of project management implementation practices includes defining the purpose and requirements of the work, evaluating the extent of the work, resource allocation for the project, planning and executing the intended project, and finally monitoring the progress of the project to ensure sustainability (Young 2003).

2.4.1 The importance of project management

Project management has multiple facets and with at least ten different features, all of which can add value to a project (Bowen 2009; PMI 2013a). Those are:

- integration
- scope
- time
- cost
- quality
- procurement
- human resources
- communications
- risk management
- stakeholder management.

However, Gido and Clements (2014) argued that the key to project success rests with those people directly involved in the project. Project integration is important, as the integrity of organisational structure shapes the coordination of project tasks and the creation of project teams (Harrison & Lock 2004; Schwalbe 2015; Walker 2015). For these reasons, formulating a well-structured project management team with a variety of talents is crucial to the project being undertaken (Rosenau & Githens 2005; PMI 2013d).

The number of project failures proves the importance of project management. There is an inherent need for specialised skills and practices, which are important in ensuring that the project is completed and that it can achieve the desired goals and objectives (Rosenau & Githens 2005; Rue 2014). The implications of project failure extend beyond the project leader and organisation, as project management is integral to regional economies, as well as economies globally to manage activities and resources, since the need for highly trained and skilled project managers increases the likelihood for project success (Rue 2014).

Project management can ensure those challenges that arise from the process of implementing a project are identified, with the possibility of being resolved early and by the right group of practitioners. In doing so, this will reduce the risk of the project failing due to those challenges (Billows 2011). Just as the need for expedient resolution of problems is essential to project outcomes, the speed and efficiency with which innovations are applied can influence them (Kadiri 2012). The competitive business environment over the past few years has increased the need for effective, innovative, efficient and timely project implementation in order to ensure that the business gains competitive advantage over rivals (Teece 2010).

In regions where organisations implement projects that underperform, there are economic consequences for the community (Atkinson 1999; Meredith & Mantel 2011). These can take the form of limited innovation, under-utilisation of infrastructure or no capacity to use it at all. Failure feeds upon failure and it becomes difficult to attract the skilled workforce necessary to form a team or manage specific aspects of projects. Such outcomes can pose a challenge to senior management and diminish an organisation's competitive advantage (PMI 2013b). On the other hand, project management affords an opportunity to promote high levels of innovation (Maylor 2005), and has the multiplier effect of stimulating the success of economic development projects that are intended to promote regional and local economies (Dmytrenko 1996; Turner 2014). Project management provides ways for innovation to transform an organisation and economy by delivering goods and services in both public and private sectors (Rosenau & Githens 2005).

2.4.2 The relationship between project management and project success

Rosenau and Githens (2005) argued that project success relates greatly to project management. In a study by Baccarini and Collins (2004) of 150 Australian project managers, the researchers concluded that the traditional iron triangle (time, cost and quality) was perceived as the measure of project success, along with achieving the owner's expectations.

This delineation between project implementation and product success had been suggested by Baccarini in 1999. Project success is completing the project on time, within budget and to the expected standard, whereas product success looks to the end-result. Obviously, the process and the product are tangibly joined, and if the end product is a failure, it is likely that the process has similarly failed (Pinkerton 2003). There is an inextricable relationship with a dependency, in that

the end product is dependent upon the process to succeed, and cannot achieve its goals or outcome without the success of that process. Thus, it is worth considering the process to be the governing reason for why projects succeed or fail, although Heravi and Ilbeigi (2012, p.526) stated that the ability to define project success 'remains elusive'. The authors point out that project success is a core concept of project management and that it is highly associated with the stakeholders' objectives and that there is a need to identify those objectives and define them (Heravi & Ilbeigi 2012), after which these could provide a measure for success. However, Davis (2014) concludes that there is a lack of coherence among stakeholders of most projects as to the objectives, which makes it difficult to agree on measures of success (Heravi and Ilbeigi 2012).

A study conducted by Akewushola, Olateju and Hammed (2012) found a correlation between the project quality and the organisation's success. The study noted that project cost appeared to be integral to stakeholders' perception of project success. The issue for a project manager is how to maintain and achieve product quality without exceeding project costs in order to achieve project success. However, Steinfort and Walker (2007) concluded that traditional measurement methodology could actually be viewed as inaccurate and unreliable; while Ramage and Armstrong (2005) held that traditional project management assessment has a negative impact on project management processes. Thomas and Mullaly (2007) observed that project management performance success could also be attributed to the project manager, the organisational culture and the size of the project. This point of view closely related to that of Fortune and White (2006) who assert that success is built on planning, senior managerial support and clearly defined objectives. Project success can be attributed to any or all of these features of projects, but these assessment tools do not necessarily guarantee success using the historic iron triangle measurements or indeed product success.

It is clear that the concept of project success includes those tasks that are associated with the project management process, such as proper preparation and implementation of the project, which should be clearly defined in the project management plan (Munns & Bjeirmi 1996). Furthermore, for the project to be successful, the project management process and plan must be defined with a strict schedule of events until completion. Project management practices are directed at assuring that the task is accomplished successfully. With an increased number of PM practices and the efficient completion of project task, the degree of project success can be increased (Papke-Shield, Beise & Quan 2010).

Young (2003) stated that product success is something that is not solely assessed at the end of the project. The product must be measured over time to determine its success and value, and the PM process tasks and practices would affirm the likelihood of product success and project success. Projects require SMART principles (Specific, Measurable, Assignable, Realistic and Timed) according to Doran (1981); those that are essential to project management. Through those practices in project management, organisations are able to predict and mitigate risks associated with the project. This is highly essential as organisations are now more frequently undertaking projects as a way to realise business objectives (Papke-Shield, Beise & Quan 2010).

Understanding the risks associated with the project will facilitate the operational path, and encourage the success of the project (Mattiske 2012). Furthermore, project management ensures that the project team manages cost in order to deliver quality results, which satisfies the client. These practices, performed well, increase a firm's competitive advantage over other firms, supporting Akewushola, Olateju and Hammed (2012) and Teece (2010). In other mature project management firms, the project goals are directly related to the strategic business objectives that give the firms a strong competitive advantage over their competitors promoting the success of these firms in a project management environment (Gido & Clements 2014).

The impact of a project on an organisation and its ability to retain or develop a competitive advantage can be seen to be directly attributable to the successful implementation of project management. The effect PM has in terms of the outcome of a project extends beyond the actual project to how the value of the project is perceived over time, such as the long-term expectations associated with the project in the first instance and what the project was looking to achieve (Munns & Bjeirmi 1996).

Given this parameter, it can be argued that the stakeholders' expectations that cost will be controlled (Akewushola, Olateju & Hammed 2012) require the project manager to accept the client and or stakeholders having an active participation in the phases of the project (Munns & Bjeirmi 1996). PMs would do well to encourage this since it increases the stakeholders' understanding of project challenges. Furthermore, the active participation of stakeholders in the process can only improve the assessment of project success and enables them to have a direct decision making influence over the financial performance of the project (Munns & Bjeirmi 1996). The participation of stakeholders is a proactive approach to PMPA, which is helpful in cases where costs are to be the sole assessment criterion.

2.4.3 Project performance

Historically most organisations measured project performance on cost savings (Yates & Eskander, 2002; Zaghloul & Hartman 2003); completion deadlines (Razek, Bassioni & Mobarak 2008) and product details were the KPIs (Turk 2006). Additionally, most studies in the last two decades focused on project success attributes based on simple models (Shenhar et al. 2001; Howsawi 2014) with disregard to project complexity, leading to a lack of consensus about the best criteria for evaluating project successes (Tukel & Rom 2001; Ika 2009; Han et al. 2012). However, current project management aims to incorporate multiple angles that are useful to determine success. Therefore, significant attention is being given to PMP modelling to complement the old focus on project performance (Bryde 2003a; Qureshi, Warraich &Hijazi 2008).

Successive studies have sought to model the key success factors that project managers consider useful for determining predictable performance criteria (Tukel & Rom 2001; Din, Abd-Hamid & Bryde 2011; Al Haadir & Panuwatwanich 2011). For example, Chan and Tam (2000) and Din, Abd-Hamid and Bryde (2011) asserted that quality standards are a key to success in projects where customer satisfaction matters. A subsequent study that supports this position was that of Chan and Chan (2004), who investigated the effects of successful benchmarks across construction projects. Construction firms consider customers to be the ultimate arbiters of quality standards from a project performance perspective (Chan & Chan 2004; Mbachu & Nkado 2006).

However, there have been divergent opinions on the meaning of the term ‘quality’ in the context of project management performance (Wateridge 1995; BSI 2000; Oakland 2000; Bryde 2003a). Thus, the notion of customer and quality in the realms of projects has been part of a major debate about whether project success is determined by the process or the product (Bryde 2003a). Studies since 2000, in seeking to model project performance, have adopted two major approaches. Firstly, as Bryde (2003a) observed, some researchers aim at models that will enable firms to use PMP to gain competitive advantage, irrespective of the project’s success or its’ implementation. Teece (2010) and Gido and Clements (2014) support this conclusion. Secondly, Bryde (2003a) noted that some researchers are keen on PMP as a thing of value in itself rather than just a means to an end, and look to measure the impact project management performance has on the outcome of the project irrespective of the KPIs. This would be seen as counter to the views held by Qureshi, Warraich and Hijazi (2008), Ali, Al-Sulaihi and Al-Gahtani (2013) and Mir and Pinnington (2014) who all agreed that KPI’s were highly instrumental in PMP.

Whereas PMP has previously been evaluated using generic and simple methods for determining success, there is a need to develop a more complex evaluation that includes timeliness and costs (Frimpong, Oluwoye & Crawford 2003), as well as quality specifications, all captured together (Dale et al. 2000). Consequently, the PMP discipline has been growing in the past decade because most organisations have recognised the importance of 'multi-dimensional /multiple-stakeholder/quality of process as well as product' as the best criteria for adjudging project success (Bryde 2003a, p. 230; Forcada Matheu 2005; Leybourne, Warburton & Kanabar 2014).

Kerzner (2014) suggested that project success can be viewed in two ways – that of meeting the time parameters of the project, i.e., being on time, and that of managing the project to the allocated budget. This position held by Kerzner (2014), would seem to be moving the development of assessment back toward the traditional measurements and not including a more contemporary thinking like that of Ali and Rahmat (2010). They argued that project cost and delivering on time are the least essential criteria in determining project performance, as opposed to the client's satisfaction and project functionality, which are of the utmost importance.

The adoption of broad based assessment measures like the ten KPIs suggested by Ali, Al-Sulaihi and Al-Gahtani (2013) that include time and budgets as part of the variables of assessment could assist in resolving the ambiguity and diversity of opinion. In fact, the Ali, Al-Sulaihi and Al-Gahtani (2013) study is particularly relevant to construction projects in Saudi Arabia, but unfortunately does not account for client satisfaction or end-product functionality, as it is highly focused on project process performance. The study does show a significant emphasis on financial measures and market share, which could be construed as a form of competitive advantage.

2.4.4 Assessing project performance

A project is an undertaking that aims to achieve a certain objective such as a product or a service within a given period (Cleland & Gareis 2006). It involves implementing a plan that aims to achieve a desired target. Projects are time bound and they require resources. Human resources are a major factor in any project. Human resources carry out project planning, implementation and management. With the utilisation of resources, it is essential that organisations measure project performance. There is need to measure the performance of a project as well as the performance of management in a project in order to maximise performance (Cleland & Gareis 2006). Defining

project performance is a question of defining project success and failure, which as Iyer and Jha (2005) pointed out is subjective and can be interpreted differently based upon each project and how it is measured.

Methods employed to measure project performance are different from those used to evaluate PMP. Kousholt (2007) asserts that methods used in measuring project performance are related to methods used in project control (Kousholt 2007). They include the following:

- ***Investment analysi***s

  Investment analysis can be used to measure management's performance in project management, thereby acting as a tool for reporting purposes (Cleland & Gareis 2006). This is essential, as before commencing a project, during the planning phase an estimated rate of return on investment (ROI) will be established, and from this, a baseline can be identified for determining actual rates of return throughout the project (Kendrick 2010).

- ***Cost–benefit analysis (CBA)***

  Project costing is essential in determining the value of requirements for the project. This function is essential in the planning and development stage as it determines the project quality and the cost to achieve it (Kendricks 2010). Similarly, CBA can provide estimates of continually associated costs like labour throughout the project lifecycle, as variable costs can rise and as decisions to make project changes can be evaluated with CBA (Kendricks 2010). Additional methods used in measuring a project's performance include:

  – *Benchmarking*

    Benchmarking involves comparing a project's success with success of other projects, which are similar to it. Benchmarking can be used in the development stage through customer interviews, or by conducting market research, and is primarily an investigative tool that enables comparative assessment and furthers decision making by analysing alternative options through comparative analysis (Kendrick 2010).

  – *Comparing actual results with budget*

    Measuring budget and actuals enables not only cost comparisons but helps in forecasting for total project cost. Comparative analysis (budget vs actual) helps to measure the impact of decision making in selecting specific requirements over others (Kendrick 2010). Cost comparisons provide measurable feedback throughout the project life cycle and are one way of determining value. Determining project cost shortfalls enables future decisions to be made as to whether to change particular project

requirements (Kendrick 2010). When cost comparisons are favourable, this measure can be interpreted as making the project a success, as well as determining its overall value. Project success and failure can be viewed solely through project cost, but this does not guarantee overall success, as the project can be ultimately on budget but deemed as lacking in quality. Similarly, the notion of cost and time are inherently linked as delays invariably increase the cost of the total project.

Variance analysis provides valuable information in negotiating changes within the project (Kendrick 2010). Budgeting provides a baseline for what the project estimates are expected to be. Analysing the variances serves to help in forecasting and estimations for future phases and thereby, make changes to the overall estimated project cost. This serves as a means of quality control and is integral to executing the project plan (Kendrick 2010). Performance indicators used in the measurement of a project's success include:

- *Project objectives and goals*

  Achieving project objectives is essential in project performance. Realisation of the objectives enables the project to move forward when there is discord, project goals are not attained effectively or efficiently and those barriers cause negative effects on project progress and outcome (Liu et al. 2011). When project goals are changed, there is project instability and disagreement can permeate across the project team (Martin, Pearson & Furumo 2007). Project objectives and goals are significant to the project outcome and changes can expose the divergent perspectives of stakeholders (Martin, Pearson & Furumo 2007).

- *Time*

  Project time constraints are composed of individual task deadlines that when aggregated equal the project completion time and adherence to this is essential in meeting the overall project objective. The need to plan within these fixed time constraints avoids project delays and reduces the risk of escalating costs. Time is considered a fundamental and critical measure in project performance (Chan 2001, Schwalbe 2009).

- *Budgetary compliance*

  The project budget according to Kendrick (2010) is derived from bottom up planning. It is from this that the total project cost is determined and forms the baseline for project performance assessment as to 'actuals vs budget' measurement. Similarly, budget compliance serves to determine the return on investment and project costings. By

reviewing project costings, a determination can be made as to whether this criterion is meeting stakeholders and project sponsors objectives (Kendrick 2010).

- *Completion*

  Task completion on schedule enables a project to be delivered on time. Budget completion can also mean completing the project on budget and could be a project objective (Munns & Bjeirmi 1996). Completion of a project in accordance with the iron triangle (time, cost and quality) is widely accepted as project success (Meng 2012).

- *Growth*

  Kerzner (2013) stated that there was potential for significant growth through the undertaking of projects. Winning contracts and the opportunity to service projects after completion can provide increased revenue streams for organisations (Kerzner 2013). One of the objectives of a business is to grow this can be achieved organically through projects that add value.

- *Profitability*

  Profitability in business organisations can be increased through employing project management as one of the overriding strategies to generate profits (Callahan, Stetz & Brooks 2011). In order to achieve this, project managers must have the requisite skills in finance and accounting specific to project management, so that project profitability is realised and adds value to the organisation.

- *Compliance*

  Compliance extends beyond business compliance to regulatory codes and laws. There are accounting rules and procedures, as well as complying to contracts, all of which are inherently essential in achieving project quality and thereby, mitigating risk and exposure to legal ramifications, delays and penalties, all of which can affect project success.

- *Innovation and customer satisfaction*

  Management success can be determined based on how customers' expectations are met. Innovation adds to customer satisfaction and it can create efficiency in the business. Management that leads to customer satisfaction is considered successful (Harrison & Lock 2004).

- *Earned value management* (EVM)

  EVM provides a project performance measurement that assimilates information as to project scope, cost and time (Schwalbe 2009). EVM is a means of assessing the three criteria against baselines and provides comparative data much as variance analysis does. EVM focuses on measuring project completion of predefined and prescheduled tasks across all facets of the work breakdown structure (WBS).

In conclusion, a project is an undertaking that aims to achieve a certain objective, such as a product or a service within a given period (Lock 2007). One of the key factors required in a project are human resources. Human resources are involved in planning, implementation and control of the project (Dinsmore & Cooke-Davies 2005). However, there exists a difference between measures of management performance and those measures used in project performance. The two differ in a number of aspects. Project performance measures are those measures put in place to evaluate the success of a project, while measures in management performance aim to evaluate the success of managers in running business projects (Cooke-Davies & Arzymanow 2003; Qureshi, Warraich and Hijazi 2008).

This concept of different measures for different purposes enables the correct measure of those characteristics that provide the necessary information that are fit for purpose (Behn 1997; Turner 2014). While measuring project implementation performance methods like variance analysis and benchmarking are ways to measure project costs and make comparisons to other projects. In measuring management's performance methods such as cost-benefit analysis, expert survey and investment analysis are used. Other aspects of their difference are in timing and the key performance indicators.

2.4.5 The significance of assessing project management performance

Qureshi, Warraich and Hijazi (2008) investigated the significance of PMP assessment (PMPA) model introduced by Bryde (2003a) based on the six criteria that included leadership, staff, policy and strategy, partnerships and recourses, life cycle process, and key performance indicators of project management in Pakistani listed organisations. Based on this investigation, it is possible to state that the PMPA model can be treated as a valid tool for collection of empirical evidence and is a reliable measurement tool in assessing PMP (Qureshi, Warraich &Hijazi 2008). Despite aiming to evaluate the significance of the PMPA model in Pakistani organisations, Qureshi, Warraich and

Hijazi (2008) conducted a literature review to determine the way managers, organisations, and other stakeholders treat project management assessment efforts. They concluded that there are alternative options that would be as effective as the model proposed by Bryde (2003a).

PMP has been viewed as a significant element in business, and in light of the current economic environment, organisations are challenged to improve and increase project performance by effectively utilising scarce resources more efficiently (Rehman, Usmani & Al-Ahmari 2012). The PMPA model has proven to be valuable in measuring the correlations between operational variables employed to achieve project success (Rehman, Usmani & Al-Ahmari 2012). Rehman, Usmani and Al-Ahmari (2012) specifically held that the PMPA model had a 'significant impact over PMP' with leadership having the utmost influence on project outcomes. Similarly, Mir and Pinnington (2014) found that PMP directly affected project success when studying the correlations of existing and new variables within PMPA. From the research, literature there is significant evidence of the value of PMPA and the role project management can have in determining project success.

Project management plays a crucial role in project success when taking into account all the stages of the project, including planning and project evaluation (Munns & Bjeirmi 1996; Dvir, Raz & Shenhar 2003; Khan et al. 2014). At the same time, Qureshi, Warraich and Hijazi (2008) mentioned that there was an effective meaningful correlation between quality management (QM) practices and project management (PM) performance, as indicated in the study by Barad and Raz (2000) and Jung and Wang (2006). The potential for utilisation of this correlation is enormous, especially in project management when properly structured.

Regarding QM practices, the PM model was developed based on the need to assess project success using valid tools and unified criteria. As such, many available assessment models have been customised to meet the needs of organisations and specific projects. Therefore, QM practices have been used for the development of PM models and customised with regard to PM functions and structure (Crosby 1979; Dale, Boarden & Lascelles 1994; Humphrey 1989, Crawford & Price 1996; Bryde 2003a; Qureshi, Warraich & Hijazi 2008; Mir & Pinnington 2014).

In other words, the quality of projects and project success was being assessed before the introduction of valid models for evaluation of project management (Crosby 1979). Quality

management tools and components have contributed significantly to the development and further modification of reliable instruments for PM assessment (Dale et al. 1994; Crawford & Price 1996; Talib, Rahman & Akhtar 2012).

A diverse array of projects can apply existing PM models due to their customisation (Humphrey 1989; Steinfort & Walker 2007). In other words, QM practices have been actively utilised to create a valid model for project performance assessment, bearing in mind the scope of criteria usually applied in diverse studies before the introduction of the PMP assessment (PMPA) model by Bryde (2003a). QM tools were used in the early stages of project development, since no adequate tools were available at that point (Barad & Raz 2000).

The literature review undertaken for the current research made it clear that the basic PMPA model devised by Bryde (2003a) has been expanded by incorporating some QM practices. Din, Abd-Hamid and Bryde (2011), for example, took the PMPA model and expanded it to include the construction sector (PMPAC), and compared the variables to financial management practices. Mir and Pinnington (2014, p. 204) similarly purported that historically the grounding of the PMPA model was not only based upon TQM's EFQM, but that there exists a 'positive correlation…between TQM practices and organisational performance'. Thereby, QM practices and PMP are essential methods for achieving continuous organisational improvement, both at a project level and success as an organisation (Luu, Kim & Huynh 2008).

Though project success can be evaluated through a number of different techniques and criteria for every separate project, a unified way of assessment has largely facilitated measurements and analysis of project success (Munns & Bjeirmi 1996; Cuellar 2010; Howsawi 2014). However, various tools applied to the same project can provide different results when evaluating project success, because there are no unified ways to conduct PM assessment (Schoemaker 1995). Leonard (2009) holds that EVM provides a mechanism of uniformity for assessment while PM practices do not. This can be seen as critical when attempting to benchmark comparative projects as those project managers who use 'ad hoc' or custom methods that are not uniform are unable to provide the necessary comparative information since the standards and methods vary (Leonard 2009).

2.5 TQM and PM performance

TQM has the potential of linking the key variables of PM and guiding an entire project to successful completion, especially within the construction sector (Talib, Rahman & Qureshi 2010; Leong et al. 2014). Consequently, several studies have shown that organisations often look upon various TQM methods to add value to project performance (Hides et al. 2000; Talib, Rahman & Qureshi 2010). Moreover, the importance of quality management techniques being applied to projects has been interpreted as potential ground for enhancing project performance (Oakland 2000). Indeed, TQM can be seen to be a quality indicator of project performance and as such, is a foundation for evaluation of success of many projects according to the stakeholders' mark of measures (Hides et al. 2000; Talib, Rahman & Qureshi 2010).

2.5.1 Using QM concepts to develop project management performance models

Some researchers assert that TQM can easily become the convergence factor between QM and PMP (Barak & Raz 2000), and that this connection has been referred to on many occasions, but few studies have covered this area. The study by Hides et al. (2000) found that TQM was instrumental in supporting the conventional PM ideas by speeding up their implementation. Another study by Yates and Eskander (2002) stated that TQM nurtures a culture where the project proceeds on the principle of continuous improvement.

Moreover, Beatham et al. (2004) have established that TQM is good for laying the foundation for upcoming project planning because it highlights all potential environmental factors that tend to pose barriers such as cultural orientation and organisational norms. According to Kotnour (2000), TQM offers essential learning processes for firms undertaking PM. In fact, Zulu and Brown (2003) successfully created a model of project management planning quality (PMPQ) that integrated quality factors in a PM process; however, the testing of the model was not conducted. Zwikael and Globerson (2004) applied the model and found that PMPQ could provide a positive relationship between PMPQ and project success in terms of project schedule, costs, customer satisfaction and technical performance

Every new project that embraces TQM tends to devolve the assessment to the customers while engaging the employees in best practice (Hsu & Jiang 2009). Other scholars consider TQM to be a means rather than an end to PM because it has various guiding principles (Karim, Marosszeky &

Kumaraswamy 2005). Moreover, organisational leaders often consider TQM as a means of ensuring project sustainability (Huemann 2004) and as a way to protect the businesses bottom line (Agus & Sagir 2001). Organisations that adopt TQM best practice help to shape their organisational culture, whereby employees are focused on continuous improvement (Adebanjo 2001), such that TQM acts as a central ethos throughout the organisation as a way to meet customer and stakeholder expectations, as well as project and organisational success (Oakland 2000). The importance of TQM in PMP has been examined in terms of its fitness with some projects in which, research shows, it can determine the sequence or steps for the overall project model (Adebanjo 2001). Additionally, TQM has been useful for the reorganisation of existing PM models because it closes the existing gaps between the theoretical frameworks and the actual practice (Meirovich, Galante & Kanat-Maymon 2006).

One of the most significant TQM benchmarks has been the ISO 9000, which is applicable on a global scale for numerous projects as a QMS standard. For two decades since its inception in 1987, the ISO 9000 has been used to bring nearly one million global organisations to QMS compliance (Martinez-Costa et al. 2009). Furthermore, the number of projects seeking ISO 9000 certification between 1995 and 2005 increased by 20% (Martinez-Costa et al. 2009). Even though the ISO 9000 has its foundations in the manufacturing sector of the economy, it has emerged into a cross industry tool on a global level (Bodas Freitas 2009).

In the construction sector, firms adopting ISO 9000 certification and practising QMS have shown enhanced project and organisational performances (Din, Abd-Hamid & Bryde 2011). Case studies have shown that ISO 9000 improves quality performance by reducing costly errors and improving customer satisfaction levels (Farooqui & Ahmed 2009). When combined with TQM, Farooqui and Ahmed (2009) found that there was improvement in quality costs and increased employee satisfaction levels. ISO 9000 has also been shown to increase organisational functionality and client satisfaction (Ali & Rahmat 2010).

Other instances when ISO 9000 has proved useful in the construction sector include new projects where the personnel have no prior experience or information about outcomes (Lim & Mohamed 2000). When firms are in crisis and want to implement a change management process (Berggen, Soderlund & Anderson 2001) ISO 9000 can be beneficial in outlining how project stages are

communicated (Yates & Eskander 2002). However, some TQM practices like 'just-in-time' (JIT) and lean management have not always provided benefit to the construction industry for various reasons (Barad & Raz 2000).

2.5.2 EFQM excellence model and it is link to PM performance

This section presents a detailed description of the European Foundation for Quality Management (EFQM) model developed in 1991. A discussion of the concept underlying the model preceeds the analysis of the model to lay a foundation to the model. The EFQM excellence model was designed to faciliate organisational competitiveness. According to Watson (2002), the model is applicable to all types of organisations irrespective of their size, level of maturity, structure, or type.

One of the fundamental reasons for the establishment of EFQM to evaluate organisational processes was to be able to provide a framework for improvement. The model was created with the intention of forming the framework for awarding the Europen Quality Management Award. The EFQM excellence model has also been shown to provide an operational framework for the implementation of TQM (Bou-Llusar et al. 2009).

The basic concepts of excellence under the EFQM model are the core philosophies whose application results in continous process improvements for an organisation. With time, the concepts are modified based on informtion obtained from the EFQM networks and members. Watson (2002) argued that the principles represent points of agreement on aspects of organisational management that lead to success and continous improvement of operational processes and stakeholder satisfaction. The fundamental concepts present the basic principles of success. It is from these principles that the model was created as a tool to actualise them. The value of the EFQM model is in providing information as to the value of an organisation's resource capability and how to deploy them to create a competitive advanatge (Ruiz-Carrillo & Fernandez-Ortiz 2005).

The list below outlines the fundamental EFQM principles of excellence underlying the model.

- Leadership and constancy of purpose, quality leadership is described as inspirational and visionary. To be successful, the leadership has to maintain a constant purpose towards which they inspire those they lead to focus their energies (Base 2010).

- Continuous improvement, innovation and learning in a competitive market; it is important to keep searching for new strategies to gain a competitive edge. As such, this principle requires the continous use of learned knowledge in organisational operations to steer improvement and innovation (Base 2010).
- Partnership development leads to excellence when organisations can continously maintain partnerships that bring value to the organisation (Base 2010).
- Use of facts and process in management, success requires facts, defined processes and a combination of interrelated and interdependent decision making sytems in order to achieve continuous improvement (Base 2010).
- People development and involvement, attaining organisational excellence requires labour optimisation which is achieved through people involvement and development (Base 2010).
- Customer focus is based on customer satisfaction through first time quality product/and services production, thereby increasing and retaining customer loyalty (Base 2010).
- Results orientation involes aligning all organisational operations with the goals and objectives of the organisation and meeting stakeholder expectations (Base 2010).
- Corporate social responsibility (CSR) echoes the norm of going beyond the regulations in the organisational setting to understand and act in response to the enironmental and societal expectations in the region of operation (Watson 2002).

The excellence model represents a translation of the eight fundamental concepts decsribed above into a non prescriptive and dynamic action plan. This operational model can be used to asses the performance of organisations across all industries with varying sizes. The model is made up of nine dimensions referred to as criteria. These include: partnership, processes, resources, people, policy and strategy, leadership, society results, people results, key results and customer results (Base 2010).

An important feature of the EFQM model is its demonstration of the causal relationships between the criteria in the operational process. In the model, the nine criteria are categorised as either enablers or result criteria. The enablers criteria are those that cover and facilitate organisational structure, process and resources. On the other hand, results criteria capture organisational performance from various perspectives. The five enablers are leadership, people, policy & strategy, partnership & resources, and processes, with the four results (being people, customer, impact on society, and business (Santos-Vijande & Alvarez-Gonzalez 2007). The EFQM model is grounded

in the argument that well developed enablers lead to excellent results. As such, a organisation will realise better results if it has more developed enablers, which are achieved through innovation and learning (Santos-Vijande & Alvarez-Gonzalez 2007).

Leadership forms the most important enabler (Santos-Vijande & Alvarez-Gonzalez 2007). The enabler's role is to drive processes, people, policy and strategy, resources and partnerships to achieve people, customer and society results and eventually the key performance results according to organisational goals. The EFQM model has nine primary criterion under two criteria: Enablers and Results (Gasparik, Gasparikova & Ellingerova 2014). Under Enablers the criterion are Leadership, People, Strategy and Policy, Partnerships and Resources, Processes, Products and Services, all under Enablers. Under Results the criterion are People, Customer Results, Society Results, and Key Results (Gasparik, Gasparikova & Ellingerova 2014). There are 32 subcriterion out of which 24 are derived from the enablers and the eight from the results criteria (Watson 2002; EFQM 2015)**.** These sub criterion are grouped under each of the nine criterion as follows:

Leadership

1 establishing the mission, vision and values. Being a role model in setting the organisation's culture for excellence
2 how leaders are personally involved in ensuring the organisation's management system is developed, implemented and continuously improved
3 leadership involvement with customers, partners and the community
4 leadership motivation and supporting organisational staff.

Policy and strategy

1 setting policy and strategy that considers both present and future requirements along with stakeholder expectations
2 using performance measurement information to establish policy and strategy and including learning, creativity related activities, and research
3 consider how policy and strategy are developed, updated and reviewed
4 by what means a framework for key processes are utilised for policy and strategy
5 the communication and implementation of policy and strategy.

People

1 the planning, management and development of human resources
2 the identification, development of human resource knowledge and competencies
3 empowering and involving staff
4 establishing an organisation-staff dialogue
5 recognising and rewarding staff.

Partnerships and resources

1 management of external partnerships
2 management of finances
3 management of equipment, buildings, and materials
4 technology management
5 knowledge and information management.

Processes

1 the systematic design and management of processes
2 innovative process improvement that adds value for both stakeholders and customers, as required
3 development and design of products and services with focus on customer expectations and needs
4 the production, delivery and service of products and services
5 enhancement of customer relationship management.

Customer results

1 perception measures
2 performance indicators

People results

1 perception measures
2 performance indicators

Society results

1 perception measures
2 performance indicators

Key results

1 key performance outcomes
2 key performance indicators

The EFQM excellence model was established over two decades ago with the aim of providing a method of quality recognition and enhancement in organisational management. The model is a non prescriptive and dynamic operational framework that can be adopted by all types of organisations to assess and sustain high performance. The model is underpinned by nine fundamental principles that define how to achieve continuous improvement. These fundamental principles are translated into an operational action plan by the model criteria. The model has a specially developed matrix, Results, Approach, Deploy, Assess and Refine (RADAR), and provides a strcutured approach to

questioning organisational performance (EFQM 2015). This assesment tool scores criteria to measure the organisational performance, when seeking continuous quality improvements (Sokovic, Pavletic & Pipan 2010).

The EFQM business excellence model has been consistenly used as QM framework model to measure organisational imporvements (Bryde 2003a). Given its grounding in TQM principles this model can serve as a framework for developing a project management performance framework model (Bryde 2003a). The EFQM model was adapted by Bryde (2003a) to overcome limitations and to have a model that purely looked at project environments to make it fit for purpose for use by project managers. Given the positive relationship that has historically existed between TQM and orgnisational performance it follows that QM pracices and PMP can imporve project success (Mir & Pinnington 2014).

2.5.3 Project management performance models

The research has indicated a need to establish and determine the success of projects both in progress and after completion (Shenhar & Dvir 2007). Given that project success is a dynamic concept and all projects inherently are unique, there is need to allow for degrees of adaptability within PMP models to account for various intrinsic factors like, e.g., specific regulatory requirements by industry sector (Shenhar & Dvir 2007). Assessing project success is both a short and long-term proposition, one that can be undertaken from project commencement, through progress to completion and beyond. Factors of evaluation such as efficiency are continually evaluated throughout the life cycle (Shenhar & Dvir 2007). Similarly, assessing customer needs is also undertaken during project progress, along with measuring the performance of project staff in a teamwork context. Post project assessment is measured in terms of realised improvements, financial profits, sales achievements or long-term innovative gains (Shenhar & Dvir 2007).

Given the narrow determination of project success, designing models of PM performance has been difficult, given the complexity of constructs, and has lacked the precision necessary to provide unified and comprehensive results (Mir & Pinnington 2014). It can be argued that the effect of the findings of Brown and Adams (2000) has brought into question the value of building project management (BPM) model assessment specifically within the construction sector. The ramifications of those findings for project management assessment extend to project quality and the

constructs within the models that are measured to assess project success (Mir & Pinnington 2014). However, Humaidi and Asarani (2012) extended the PMPA model by adding knowledge just as Din, Abd-Hamid and Bryde (2011) had with finance and construction. Humaidi and Asarani (2012) developed a KPMPA model and found that KPIs were the greatest influence on project success and that the KPMPA model was a useful tool to determine project performance. Therefore, not only is there a need to design a model that measures accurately the value of the constructs, but there is also a need to consider factors like shareholders' perspective, multi-dimensional performance, sustainability and successful completion. Furthermore, there is a practical need for the development of models of PM performance to have a theoretical and practical value and a universal applicability.

2.5.4 PMPA model

Project management and quality management are interlinked (Barak & Raz 2000), but specific tools should be applied to analyse project performance and management quality (Bryde 2003a). The overall study by Bryde (2003a) offered a set of comparative characteristics and enumeration of case studies that have investigated PM performance or attempted to analyse management quality using a number of different criteria. Rehman, Usmani and Al-Ahmari (2012) found that organisational operational factors were highly correlated to PMP in Saudi Arabian organisations despite the context that those operational factors were limited when employing the PMPA model. While it is recognised that there is a need to assess PMP within an organisation, it is necessary to tailor the assessment criteria based upon individual project and organisational needs (Rehman, Usmani & Al-Ahmari 2012). This notion supports previous findings by Atkinson (1999) and Tukel and Rom (2001) that satisfying the concept of quality as part of project success is directly measured by the level of stakeholder satisfaction (Qureshi, Warraich &Hijazi 2008).

With varying needs of project assessment and determinants of quality, PMPA is a consistent model that can be applied across projects and that measures multiple levels of quality, operational or otherwise. Mir and Pinnington (2014) affirmed that the PMPA model was in fact a valuable framework for measuring PM performance. This measure asserted the value of project management and that project success is a culmination of meeting several factors, including customer satisfaction, organisational success, and the long-term value from the project (Mir & Pennington 2014).

However, some projects may be treated as successful simply by meeting the requirements of the customer; others can be treated as unsuccessful due to lack of consistency between the expectations and outcomes (Kerzner & Saladis 2009). In other words, the success of the project cannot be predicted by the fact that the PM team has met the timelines and budget requirements. This brings the project success argument back to the two facets of project management process and project product perspective as stated by Baccarini (1999). For example, measuring the project management aspects of budgeting and planning in terms of project success may not reflect the level of project management effectiveness. Mir and Pennington (2014) specifically stated in their study that PMP had little effect on a project's efficiency level. This suggests that the efficient management of project processes, like financial aspects or planning, are not direct determinants of project success. This would then support Baccarini (1999) and that any model must consider both aspects of the project, the process, and the product.

A number of diverse methods and criteria for project management implementation and project quality evaluation exist; it is clear from the research that the fact of meeting the time, cost, and quality (the iron triangle constraints suggested by Barnes) (Langston 2013) has become insufficient for meeting the growing demands of stakeholders. Modern project complexities include project scope, increasing project objectives and financial constraints coupled with stakeholder expectations (Langston 2013). This certainly holds true if evaluated strictly on project failure rates, but even more so when considering increasing project demands like safety requirements, sustainability, quality management requirements, stakeholder satisfaction and budgetary constraints (Fortune & White, 2006; Kerzner & Saladis 2009; Toor & Ogunlana 2010; Langston 2013).

Given the modern complexities and constraints of the iron triangle there is a need to replace the iron triangle with a more meaningful measure of project success. Nonetheless, the central issue is how to account for those factors that extend beyond the project team to affect project success, like those external factors that influence the project (de Wit 1988; Munns & Bjeirmi 1996). It could be argued that the PMPA model devised by Bryde (2003a) is one such tool as affirmed by Mir and Pinnington (2014). The PMPA model can be suggested as a valid alternative for PMP assessment. Furthermore, the foundation established by Bryde (2003a) is composed of extensive collected and analysed data, including effective and relevant research and includes criteria that can be adequately measured in diverse organisations with different structures and operational designs.

As stated by Bryde (2003a, p. 230), models for measuring project performance can work effectively in two major directions: first, helping organisations to arrange effective PMP, resulting in 'beneficial outcomes, regardless of the success or otherwise of the project being managed'. Second, PM performance models can 'influence overall satisfaction at the outcome of a project, which is the overriding measure of project success' (Bryde 2003a, p. 230). In other words, two sets of criteria are required to distinguish a rubric for measuring project effectiveness. Though some project managers insist that teams need to work on projects 'without changing the corporate culture,' most projects are related to 'change - with knocking down the old and building up the new' (Baguley 1995, p. 8).

At the same time, the cost effectiveness of the project, along with the ability of the team to meet the budget, was among the factors adding to project success. Kerzner and Saladis (2009) focused on the cost of projects and their value, taking into account internal, financial, future value, and customer-related value when structuring the project. Nevertheless, Bryde (2003a) started with the use of quality management concepts for the development of an effective model that would be valid and reliable in determining PM performance.

The PMPA model was based on the EFQM business excellence model that comprised enabling criteria – 'leadership; people; policy and strategy; partnerships and resources; and processes' (Bryde 2003a, p. 232) – and results criteria – 'key performance results; people results; customer results; and society results' (Bryde 2003a, p. 232). Despite the willingness to apply an unmodified EFQM business excellence model to measure PM performance, it would have a number of limitations due to differences between organisations and their approaches (Bryde 2003a). As stated in the study by Bryde (2003a, p. 233), the integration of the EFQM business excellence model for assessment of PM performance requires the introduction of the PM leadership system that would be used to inform staff members about the role, functions, and significance of the PM performance. In addition, 'The EFQM criterion of 'people' puts emphasis on planning and managing human resources and providing reward and recognition' (Bryde 2003, p. 234).

2.5.5 PMPAC model

The PMP Assessment for Construction (PMPAC) model was developed to measure PMP in the construction sector (Din, Abd-Hamid & Bryde 2011). While there have been extensive studies

conducted on the construction sector specific to Saudi Arabia (Faridi & Al-Sayegh (2006); Al-Kharashi & Skitmore 2009; Ali, Al-Sulaihi & Al-Gahtani 2013; Ikediashi, Ogunlana & Alotaibi 2014) and the continued issues associated with project failure like project delays, the PMPAC model has shown value in specifically measuring determinants for project success in this sector. Other factors that have contributed to negative project performance have been poor financial management, risk management and managerial communication issues (Ikediashi, Ogunlana & Alotaibi 2014).

While the research conducted by Din, Abd-Hamid and Bryde (2011) focused on the integration of ISO 9000 certification and construction project performance within the Malaysian construction sector, this model could similarly serve Saudi Arabia's construction sector. Furthermore, in addressing the need to expand the notion of quality management within the PM performance framework as noted by Barak and Raz (2000) and Bryde (2003a), the research study of Din, Abd-Hamid and Bryde (2011) incorporated ISO 9000 certified organisations and project performance and found significant benefits. This research extended the PMPA model to consider a broader emphasis on financial management practices as a variable and focused within the construction sector (Din, Abd-Hamid & Bryde 2011).

While results from the Din, Abd-Hamid and Bryde's (2011) research advances the PMPA model both in terms of constructs and applicability, the results must be considered in the context of the industry sector. What can be asserted is that the value of the success of the PMPAC model in evaluating determinants of project success has advanced the Bryde (2003a) PMPA model and coupled it with research undertaken by Qureshi, Warraich and Hijazi (2008), Rehman, Usmani and Al-Ahmari (2012), and Mir and Pennington (2014). In this respect, the main criteria facilitates our understanding of the major difference between the two models, since the PMPAC model touches upon financial activities and enables researchers to identify any flaws in the PMP in terms of financial issues. In combining the PMPA model with financial management practices, Din, Abd-Hamid and Bryde (2011) have merged Bryde's (2003a) model with those factors Kerzner and Saladis (2009) stated added to project success.

The application of assessment models in different geographic locations should be considered as a crucial factor in the effectiveness of different tools. For instance, the study by Qureshi, Warraich

and Hijazi (2008) applied the PMPA model to measure performance of Pakistani organisations, while the initial research by Bryde (2003a) was used with British organisations, while Mir and Pinnington (2014) undertook their study in the UAE. What this suggests is that despite the success of the PMPA in evaluating factors for project success, geographic location should not be overlooked any more so than the discreteness of what factors are relevant to each individual project. As Santos-Vijande and Alvarez-Gonzalez (2007) pointed out, the use of EFQM in Europe can be construed to be applied to an area that has similar practices, thus greater generalisation can therefore be made.

Until the PMPAC has been tested in a broader context beyond the initial study conducted by Din, Abd-Hamid and Bryde (2011), making broad assumptions can be misleading. What is known is that the success of a project can be measured and enhanced through a certified quality management system (QMS), thus effective project management can be improved by implementing QMS and by using the PMPAC model (Din, Abd-Hamid &Bryde 2011). The PMPAC model consists of all the factors that can affect project quality, the most adequate criteria for measuring project performance, and a financial component that enables researchers to analyse the financial variables.

To conclude, the PMPAC model was clearly defined and explained in the study by Din, Abd-Hamid and Bryde (2011), where the six major criteria for performance evaluation used by Bryde (2003a) were labelled as enablers, while project management key performance indicators (KPIs) were treated as results. At the same time, 'FM practices became an additional element of PM performance, labelled 'financial management', which resulted in enhanced outputs and outcomes as measured against the defined PM key performance indicators (KPIs)' (Din, Abd-Hamid & Bryde 2011, p. 1053). When applying the PMPAC model to Saudi Arabian construction projects, it was possible to analyse the performance of those projects and contribute to the analysis of the PMPAC model's significance. The assessment of the Saudi Arabian projects facilitated the implementation of the selected model for performance measurement. Conversely, the application of this model in Saudi Arabia can become another stage for development of the model, bearing in mind that a financial management component was added to the initial structure of criteria selected for performance measurement. Finally, the context of that model in focusing in the construction sector has a high significance to Saudi Arabia and its current level of developmental expansion.

2.5.6 EFQM Model

The clarity of the features of the PMPA model resembles the European Foundation of Quality Management (EFQM) models because they are consistent at every stage and reliable in evaluation of project performances across diverse industries. Nevertheless, EFQM could pose some challenges to the PMP and these can be mitigated by adequate controls, which fit within the organisations' goals of generic models (APM 2000). Another reason for using the EFQM is its role in the advancement of the PM theory, as evidenced by Bryde's (2003a) use in the evaluation of causal correlations of the enablers and results (Santos-Vijande & Alvarez-Gonzalez 2007). Even though aspects like project timeframes emanate from the basic principles of PM, EFQM will ensure that the theoretical frameworks fit with the utilisation of organisational resources. Additionally, EFQM is useful in connecting the project stages and ensuring best value from investments. EFQM can be used to close gaps between concepts and outlining approaches and techniques for implementing projects under diverse conditions.

The EFQM model primarily emphasises total quality and continuous process improvements to drive organisational performance (Nabitz, Klazinga & Walburg 2000). When the project is in a competitive environment, the organisation must look for a competitive advantage such as technology to ensure the mission is realistic (Schwalbe 2015). Through EFQM's enablers, an organisation can identify opportunities to improve performance to achieve or sustain a competitive advantage (Santos-Vijande & Alvarez-Gonzalez 2007). The EFMQ model supports organisational excellence whenever projects are underway as the model provides analysis at every stage of the deliverables.

2.6 Summary

Chapter 2 focused on the theory of RBV, as well as discussing the development of the PMP model (PMPAC) that will be further elucidated in Chapter 3 and used for the research investigation. The chapter considered the value of quality management in PMPA and discussed the various beliefs of what is important to assess in determining project success. The chapter outlined the evolution of the EFQM model to PMPA and to PMPAC and discussed alternate models like PMPQ, BPM and KPMPA and how this development can be seen to reflect a need to replace the iron triangle with a more contemporary model that considers a broader spectrum of variables (enablers).

Further to this, a discussion was presented regarding RBV and its associated value in strategic management. As quality management techniques, including TQM and frameworks like ISO 9000, in providing value to PMP. The RBV and PMPAC model represent two essential tools for the

research undertaken in the research reported in this thesis. Understanding the relationships between those variables could provide significant value in understanding what affects project success.

While there is immense research on PMP, there is limited research using the PMPAC model and so opportunities exist to expand the understanding of its application in measuring project performance and project success and identifying the primary drivers that correlate to success and performance. While research has shown that the PMPA and PMPAC models are of value, there still exist questions as to which variables have the greatest effect. For example, Qureshi, Warraich and Hijazi (2008) asserted KPIs were the biggest influence on project success, this was similarly found by Humaidi and Asarani (2012) and Mir and Pinnington (2014). However, Rehman, Usmani & Al-Ahmari (2012) found that leadership was the primary driver of PMP. Din, Abd-Hamid and Bryde (2011) took the research to a new dimension by considering QMS ISO 9000 enhances PM performance. By employing the proven PMPAC and extending it with change management, the current research sought to confirm the model's inherent value in assessing performance, while examining this specific model in the context of Saudi Arabia. The PMPAC model and RBV are the foundation for this research and a means by which to study the variables that affect project performance, which is central to this thesis.

Chapter Three

CONCEPTUAL MODEL

Chapter 3 discusses the extension of the PMPAC model by broadening its conceptual framework in order to provide Saudi Arabian organisations with an augmented perspective of the value that PMP practices provide when implemented appropriately. A construction based model was adopted so to provide a conceptual framework that was industry appropriate (Goparaju 2012), particularly as the focus of this research project was to evaluate Saudi Arabian construction projects, which are predominantly the core project type being undertaken in Saudi Arabia.

The PMPA model has also integrated project change management into it as change management has proven to provide value-added changes while minimising adverse changes (Ibbs, Wong & Kwak 2001). The need to improve organisational project performance through change was the focus of a study by Elg and Kollberg (2009) argued that performance measurement could be employed to drive organisational change. The adaptations will provide a mechanism that will benefit both Saudi Arabia and the region given the similarities of culture and historical communication problems that have affected project efficiencies (Loosemore & Al Muslmani 1999). Project change management will be considered as a contribution to both the knowledge and the adapted model. The main purpose of the study is to enhance the project management practices in Saudi Arabia and provide a mechanism to improve project performance.

Peteraf and Barney (2003) redefined the resource-based view (RBV) theory, to augment their contentions and arguments that RBV is primarily a value creation theory. An underlying premise of RBV theory is that there are sufficient strategic resources to foster a competitive advantage (Barney 1995), thereby achieving performance level expectations and thus, the sustainability of competitive advantage.

3.1 Conceptual model and hypotheses

The development of PMP models since Bryde (2003a) and Din, Abd-Hamid and Bryde (2011) has increased the level of understanding of the effect specific variables have through their relationships in determining project success. By enhancing this understanding, PMP models provide organisations with an increased ability to assess the correlations between competing objectives and resource utilisation as determinates for project success, organisational growth and competitive

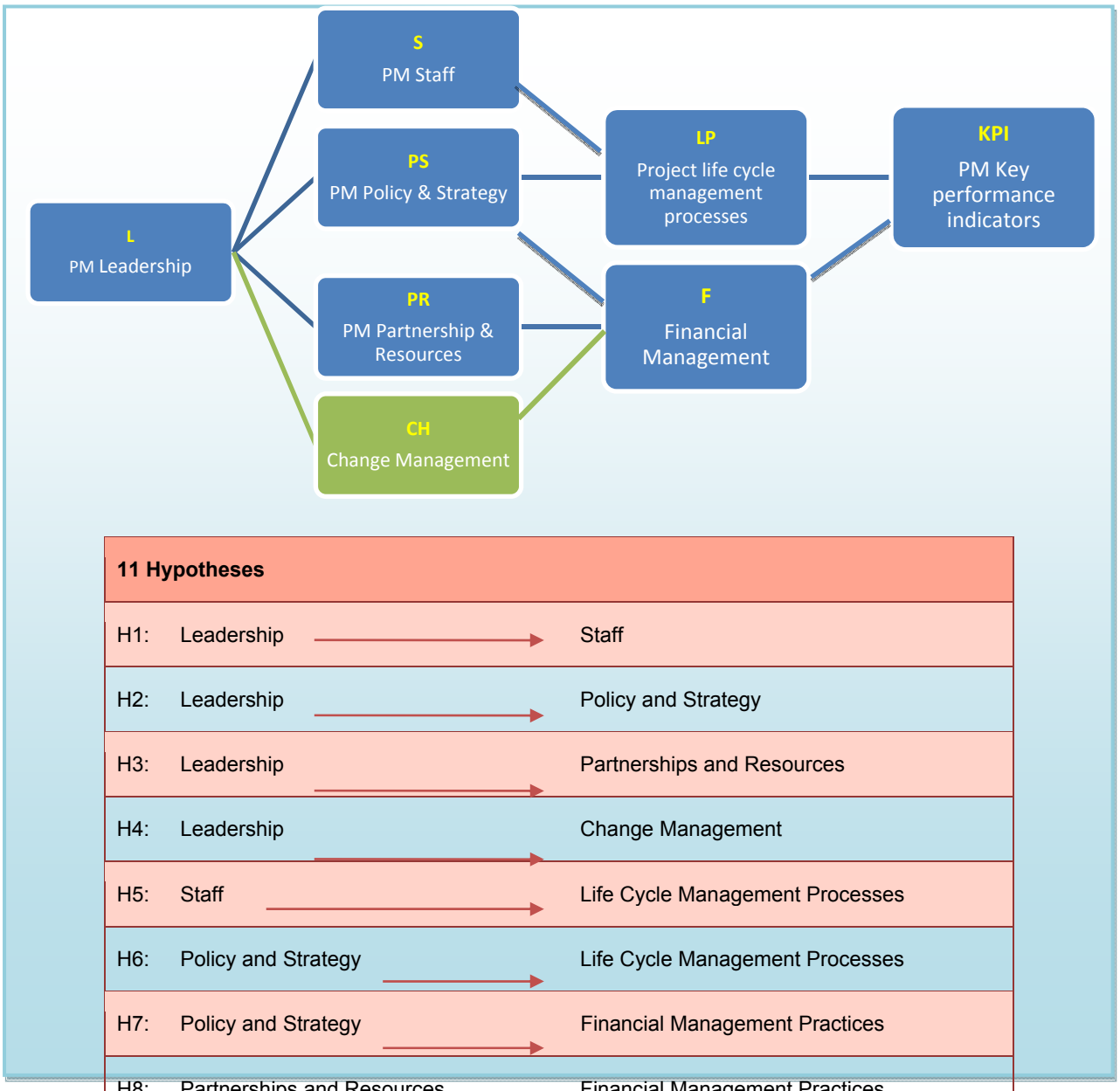
advantage (Langston 2013). Understanding this integration of project management is seen as the most significant area within PMBOK (PMI 2013a; Zwikael 2009). The need to comprehend the combining or uniting of these variables is what sets this area apart and enables an understanding of their congruence (Kirsilä, Hellström & Wikström 2007).

Through the establishment of PMP models as a tool for project performance determination, these could be construed as a solution to address the practical barriers in assessing the performance of the given project. In terms of examining the effects of variables on project performance, there are two broad elements to consider – project management (PMP) performance practices and financial practices. In addition, project change management could include tangible measures of performance.

The research includes 11 hypotheses to test the relationship between each of the constructs as shown in detail in Figure 3.1. The figure also illustrates the eight variables used for the evaluation of project management in the participant organisations:

- project management leadership
- project management staff
- project management policy and strategy
- project management partnerships and resources
- project life cycle management processes
- financial management
- project change management
- project management performance indicators (KPIs).

The variables presented and possible relationships will be tested with the model hypotheses.



11 Hypotheses		
H1:	Leadership →	Staff
H2:	Leadership →	Policy and Strategy
H3:	Leadership →	Partnerships and Resources
H4:	Leadership →	Change Management
H5:	Staff →	Life Cycle Management Processes
H6:	Policy and Strategy →	Life Cycle Management Processes
H7:	Policy and Strategy →	Financial Management Practices
H8:	Partnerships and Resources →	Financial Management Practices
H9:	Change Management →	Financial Management Practices
H10:	Life Cycle Management Processes →	Key Performance Indicators
H11:	Financial Management Practices →	Key Performance Indicators

Figure 3.1 The conceptual model and hypotheses

The next section will define and explain in detail each of the constructs of the conceptual model and the relationship between each of them based on an extensive review of the literature.

3.2 Defining each construct

Project management is defined by Fox and Van Der Waldt (2007) as the means by which projects are managed and change is achieved. A specific intervention is required to achieve something unique. Gray, Larson and Desai (2006) argued that it requires a specific form of management of work activities to move from a current, specific situation to a desired position. To understand project management activities and practices there are several terms that must be explored as they can help to explain the relationship between different processes and stages in the project (Gray, Larson & Desai 2006). These terms are discussed below with a critical perspective of how they are significant in project work.

3.2.1 Project management leadership

Project management leadership has historically not been discussed or identified as a critical factor in project success in terms of the leader's style (Turner & Muller 2005). However, project success has been attributed to competence and the need to recognise leadership styles throughout a project's life cycle. Furthermore, leaders have the primary responsibility for promoting an effective environment and PMs have intrinsically preferred transactional task orientated behaviour as opposed to transformational people-orientated leadership styles (Turner & Muller 2005).

Barber and Warn (2005) suggested that project managers exhibit two styles of leadership – transformational and transactional. Furthermore, a proactive leader who can anticipate problems and influence project direction will achieve greater project success since they tend to exert more control (Barber & Warn 2005). Barber and Warn (2005) argued that the transactional approach to problem solving, unlike being proactive, focusses on reactionary decision making that can be viewed as a contributory factor in project problems and failures. For these reasons, among others, organisations are beginning to concentrate on the role of leadership in project success and consider good leaders vital to project outcomes (Meredith & Mantel 2011).

According to Baker, Murphy and Fisher (2008), project management leadership influences the overall project performance. In recent years, research has supported the idea that effective project leadership resides in individuals who possess a substantial blend of technical and managerial skills, with more emphasis on leadership skills that are internally compatible with the motivation of the project team (Anderson 2010). Slevin and Pinto (1991) pointed out that negative or poor leadership skills in the project team account for over 67% of project failures; this was reiterated by Zhang and Faerman (2007).

Project management leaders require both relationship and task oriented leadership styles to cope with the challenges occurring during different stages of the project (Stevenson & Hojati 2007). Project managers must direct their team towards the completion of project tasks on time and within budget, setting an example to their team until completion. Attaining the goals and aims proposed in the project is an ultimate test of their leadership ability (Barcan 2010). Hyvari (2006) suggested that specific management and leadership skills, such as planning, communicating, organising and the ability to network are behaviours that add value to a project and promote success. Leadership has thus become an important factor in the management of projects (Anderson 2010).

3.2.2 Project management staff

The project staff or team is a critical body in the implementation process (Walker 2015). They carry out the activities for the project until completion (Highsmith 2004). Availability and an able and willing team are important determinants in the success of the project. Teamwork and team building are important considerations for effective and efficient management of project tasks (Scarnati 2001; Gido & Clements 2014).

Project staff refers to the individuals directly involved in the implementation of the project plan (Crawford 2005; Wilson 2014). The team leader is always the project manager who must develop a good working relationship with other staff. To complete the project in the set time, the project manager has to work as part of the team (Crawford 2005; Wilson 2014). In addition, the project leader has to ensure that the staff will be available throughout the project duration to ensure smooth completion of the various project tasks (Crawford 2005; Wilson 2014). The value of having highly trained staff within a team that have relevant industry experience e.g. construction sector can add value in terms of commitment, specialised knowledge and thereby increase project effectiveness and the likelihood of project success (Cooke-Davies & Arzymanow 2003; PMI 2015).

Researchers (Bryde 2003a; Mir & Pinnington 2014) stated that project capability was likely to increase when project staff is increased and development occurs. However, Kerzner (2013) stated that within the construction sector constant changes can affect project management effectiveness and that the project staff should remain lean in order to maintain effectiveness and achieve project goals. The lean aspect of the project team enables rapid agility to respond to more typical hierarchical structures found in organisations (Cowie 2003). Cowie (2003) differed on the idea of relevant discrete knowledge in that he believes that the project staff should have a variety of expertise's to enable quicker solutions to be formulated to problems that arise.

Given the fluidity and constant change that has been elucidated here within the construction sector it bodes consideration how necessary it is to have staff that can respond to the dynamic nature of change management especially with regards to planning and control (Park & Pena Mora 2003). Staff that can capture feedback processes can mitigate the impact of construction changes (Park & Pena-Mora 2003). In order for project success to occur it is essential that project staff are properly trained and assessed (Mir & Pinnington 2014). The correlation between the need for highly skilled and knowledgeable staff and project success has been proven, thereby it follows that there is need to evaluate their performance and this is supported by research (Cooke-Davies-Arzymanow 2003; Mir & Pinnington 2014).

3.2.3 Project management policy and strategy

Policies and strategies are important factors to consider if the objectives of the project are to be met (Allen, Jimmiesona, Bordia & Irmer 2007). They include ways of making use of human capital and the resources of the project to ensure that the project runs to its completion. *Strategy* can be understood through an exploration of such phrases as where you are currently; where do you want to go; and how will you get where you want to go (Cummings 2008). These questions are based on the entire duration of the project. Strategies are important in project implementation and design (Fish & Zajac 2006; Pinto & Slevin 2008). They facilitate the project plan and any necessary modifications. Strategy considers elements, such as, why the project should exist, the intended role of the project, how the objectives are to be met considering the available resources, and time allowed (Crawford 2005; Awaal 2014).

Policy is described as the principles regulating the actions of an organisation. It embraces the common goals, acceptable procedures and activities that are to be followed by those working for the organisation and provide a rigid framework by which project management methodologies are set (Crawford 2005; Kerzner 2013). The policy offers a base for the conceptualisation of the strategies, plans, legislation and other responsibilities throughout the task duration. However, policies are pliant and can be changed from time to time in order to accommodate the task environment. Such modifications may arise because of the introduction of new technology, economic fluctuations and other common factors influencing project management. Policies are subject to changes, due to changing vision and goals. For the project to be achieved within the set time successfully, strategies and policies used should be analysed and verified (Crawford 2005).

Kerzner (2013, p. 936) has stated that for project management goals to be realised and to achieve success, it is more important to have 'good project management methodologies that are based upon guidelines and forms rather than policies and procedures'. This would suggest that there is a separation between the methodologies and the organisational policies, by which projects are governed and this could be construed that projects work independently in achieving organisational goals.

Historically projects have invariably been undertaken by organisations without aligning them to organisational strategies or goals (Miller 2002). The project management process has been identified as not supporting the organisational strategic plan. The misalignment of the organisation's business strategy with project management has resulted in project failures and also impacts on organisational success since project success can be deemed a business outcome (Shenhar et al. 2007), whereby the organisation cannot reap the rewards and achieve a competitive advantage. By aligning the two aspects of project management process with organisational strategy, project performance can be improved, since project management can achieve a competitive advantage (Srivannaboon 2009). Shenhar et al. (2007) went so far as to say this disconnect is a 'missing link' and that there is a need for a project strategy to bind the project plan and business strategy.

The diagram below illustrates the connection between the organisations business strategy and the project.

Figure 3.2 **The 'Missing Link' between business strategy and the project plan (Shenhar, Milosevic, Dvir and Thamhain 2007)**

The importance of this strategic alignment is especially essential within the context of managing multiple projects to establish coherency and efficiency (Gareis 2004), this would contradict the precepts that Kerzner (2013) has suggested. By having both strategic and project alignments these can become embedded within an organisation so that they are able to adapt rapidly to changing environmental factors, as well be part of the culture (Aubry, Hobbs & Thuillier 2007). Thereby, project management can be considered one aspect of implementing organisational strategy. It has been stated that frequently project management processes have not supported the organisational strategic plan (Gray & Larson 2003; Crawford 2012), thus it follows that this would then lend itself to working negatively against the organisations competitive advantage. The importance of aligning organisational strategies can best be identified by the organisations commitment to project management by the allocation of and alignment of the resources required when undertaking a project (Hanley 2007; Crawford 2012). In order to bridge this divide it is important that project managers are involved in strategy formulation alignment (Artto & Dietrcih 2004; Patanakul & Shenhar 2012), this is contrary to PMI who hold that the project managers is not necessarily involved in formulating change strategies (PMI 2013c).

Project management framework policy and strategy formulation can be viewed as both how it is planned and how it is methodically introduced (Bryde 2003a). Bryde (2003a) further stated that there must be a link between strategic organisational level and that of the tactical project level. This serves as a significant point if considering Mir and Pinnington (2014) study where they viewed PM Policy and Strategy as a macro concept that was not necessarily a factor operationally at the project level. This would then seem to counter what Bryde (2003a) has suggested. It can be argued that there is need to include project management as part of the organisational policy structure as well as the strategically to achieve a competitive advantage.

3.2.4 Project management partnerships and resources

For projects that will be carried out internally, the project manager sets out commitments from specific people or organisations that will work on the task. For the tasks that will be outsourced, the project manager clearly defines the reach of work and deliverables (Gray & Larson 2008). The project managers also assign responsibilities to the parties involved, specific individuals or subcontractors for the various tasks ahead in the project. The project managers are accountable for the failures and the achievements of the project, and for staying within budget and on time without

compromising the character and health and safety of both the team and the beneficiaries. Project directors should always ensure that the partnership mutually benefits the project and the long-term sustainability of the project (Gray & Larson 2008).

Successful project management teams must effectively manage the resources assigned to the project. The project manager must manage the equipment allocated to the project and the material required by the team. These resources should be available in the right quantity at the right time. The project team, of course, must be led and managed, including any labour subcontracts that arise (Gray & Larson 2008). Human resource management should ensure that the team is motivated and allow them to 'own' the project. Such measures ensure that they use material resources effectively and efficiently (Gray & Larson 2008).

The variable of project management partnerships and resources is construed to consider the aspect of the supplier relationship particular in light of the degrees of success that have occurred within large scale construction projects (Bryde 2003a). Furthermore, the concept of partnering is a means by which to consider stakeholder engagement both internally and externally as drawn from the EFQM model (Bryde 2003a). Project partnering is considered an essential aspect in the project life cycle as procurement is a critical aspect of the project during the development and post project management (Bryde 2003a). Mir and Pinnington (2014) go further to suggest for project performance to yield success that project partnerships must ensure a 'win-win' approach for all stakeholders. Project management partnerships are seen as part of an effective project management strategy (Mir & Pinnington 2014). Thus it follows that there must entail an open two-way communication for partnerships to be workable. Mir and Pinnington (2014) specifically noted the fact that project leadership in the area of project partnerships was essential to achieving project success. Furthermore, by creating new opportunities for partnerships and by augmenting the existing internal and external customers this can increase project performance (Mir & Pinnington 2014).

3.2.5 Project management lifecycle process

The successful project management process should address all the phases of the project lifecycle. It is noteworthy that the work phases are arbitrary, but are well defined, with the transition from one phase to another involving the transfer of a deliverable (a document, a piece of software, invoice,

and bill of materials and/or report) (Augustine et al. 2005). Although project life cycle phases appear to operate sequentially, the exchange and approval of the deliverables can actually be highly iterative. The deliverables generally relate to tasks that have been assigned specific timetable milestones (Berg & Karlsen 2007).

The project lifecycle consists of five steps (PMI 2013a):

- project initiation
- planning
- implementation
- monitoring and control
- the closing stage.

Each of these steps requires a clear objective, definition and budgeting. Initiation normally involves taking action defined clearly in the documents, such as the business case, feasibility study, and terms of reference, appointing the team and the setting up a project office (Crawford, Hobbs & Turner 2006).

The planning phase involves developing the project plan, resource design, financial plan, quality design, an acceptance plan, and communications design. In the implementation phase, there are activities, such as building the deliverables and controlling the project delivery, scope, costs, quality, risks and issues. The last stage is the closure of the project. It involves activities, such as winding-down the project by releasing staff, the passing over of the project to the customer and later completing a post implementation review (Atkinson, Crawford & Ward 2006).

3.2.6 Project management performance indicators

Key performance indicators (KPIs) in project management consist of specific measurement tools that indicate how well project teams achieve specific goals. The project management KPIs are usually agreed upon during the initial stages of the project. They reflect on the organisation's central concept of the project and address the measures that position project responsibility in the administrative divisions (Augustine et al. 2005).

With each team having varying tasks to complete and roles to play in the main project, they all support the processes used in the KPIs assessment in their own way. Developing a clear understanding of KPIs in project management can facilitate the building of team synergy that is an

effective way of helping the team by providing a framework for the data analysis required to keep track of organisational project success. KPIs consist of the critical performance goals in all aspects of a project, and so establish standards and goals. KPIs are quantifiable measurements that may be shared and analysed in the organisational divisions at any time. In fact, they unify organisational efforts (Meredith & Mantel 2010).

KPIs primarily serve to measure project performance both independently and within the organisation, and generally represent specifically determined outputs or outcomes of a project (Collin 2002). It has been held that there is a need to limit the number of KPIs to maintain manageability and thus sustain continued use, because an overabundance and the complexity of KPIs can inhibit time management and resource utilisation (Collin 2002). However, the systematic reference to KPIs across projects drives and underlies their primary value (Collin 2002). Therefore, determining the correct KPIs can be seen as integral to project success. Langston (2013) has in fact stated that KPIs should be delineated according to value, speed, complexity, innovation, efficiency, and impact and that these attributes would measure core constraints with the use of ratios. The use of metrics can add project value to incentives, additional resources and other aspects of the project, indicating where support, guidance and additional input may be required to drive project success (Cicmil et al. 2006).

3.2.7 Financial management (FM) practices

In project management, financial management is an important element that should be considered (Jones, Jimmieson & Griffiths 2005). It consists of a well-set framework of financial flow in and out of the project. These practices are aimed at ensuring that the budgeted amount runs through the project lifecycle. Effective financial management ensures that the funds for the project are appropriately utilised (Meyer et al. 2007). Successful project management is an art and a science that takes financial practices into account (Oaklanda & Tannerb 2007). In addition, it ensures that the financial flow of the budgeted amount sustains all the activities within the project.

The financial cost associated with each project; may be expressed in terms of cost of labour hours or purchase price of the materials required for the project (Oakland & Tanner 2007). For this reason, an estimated budget is clearly formulated that takes into account financial flows within the project and then totals them for presentation in financial statements. These estimates must be

accurate or they may result in a loss. When the cost estimations for the project are completed, the estimated costs are then matched to the actual costs to find the variances. Such understanding helps the project financial officers to avoid any unfavourable variances in the future, taking into account the risks associated with the project.

Financial management practices are aimed at ensuring that the finances in the project have been accounted for at the end of the project (Rigby 2005). They facilitate the development of a clear financial structure for the funds within the project as illustrated in the financial statement. Accountability in a project is crucial since it makes it easier to carry out a project audit (Todnem 2005). It is imperative to state the amount projected for each component, using the budget to prevent unnecessary costs (Van de Ven & Poole 2005).

3.2.8 Project change management

According to APM (2000), change management is defined as:

> *the formal process through which changes to the project plan are approved and introduced. Also the process by which organisational change is introduced.*

Within PMI (2013c), the definition of good change management is expressed as:

> *Good change management is not simply about communicating the benefits of the project to the organization. After all, no change management plan in the world will save a poorly conceived or executed project. Good change management, through its increased emphasis on understanding and managing stakeholder needs and expectations, is also about affecting the substance of the change. By integrating change management activities into project design and decision making, the quality of the overall initiative will be increased. This will help facilitate the subsequent adoption of project outputs and deliverables.*

The principal aspects of these definitions highlights the importance of the timing of the process changes, communication to staff, stakeholder engagement the effects of change were discussed, albeit briefly in the sections outlined. In fact Ibbs, Wong and Kwak (2001, p. 160) specifically noted the importance of communication and the 'documentation of the critical project success factors between the team members is very important, because they will become part of the scope of the project.' The need to add value through beneficial changes was deemed equally important and that financial decisions have caused a significant impact on projects (Alaghbari, Kadir & Salim 2007; Jarocki 2014). Therefore, the need to exercise change management as it relates to decision

making with regard to project costs, financial procedures, including financial risk, and the need to model those costs and financial returns is deemed significant (Cook 2004; Motawa 2012), such that implementing change management within the financial context of a project is imperative (Jarocki 2014).

The intervention of change in project management requires a definitive decision to enact a transformation of one state to another much like organisational change (Parker et al. 2013). Prosci (2008) stated that change management in the project environment requires the management of staff as stakeholders, the process, the capital employed, and any changes to structure. Much like project management, change management requires specific leadership and communication skills (Prosci 2008). Just as Schein (1985), Brown and Eisenhardt (1998) and Child (1997) stated organisational change was a change of state both culturally and structurally, project management is seen as a transformation of an organisation from its current to a future state, thereby it can be concluded that they have the same end goal (Parker et al. 2013). While their approaches may differ, the end results can benefit considerably when integrated effectively (Prosci 2008). In fact, the Project Change Model (PCM) devised by Prosci (2008) integrates change management, project management and leadership and that their complementary coexistence is critical for there to be any transformational success.

The importance of grounding change management within the context of organisational frameworks is that projects can exist internally and externally within organisations and that, the same soft skills used for change management in organisations can be applied to the project environment. Park and Pena Mora (2003, p. 216) supports this managerial decision making with change in the construction project context by stating that ‘managerial changes can be made on succeeding tasks by adopting a different method or process’ and that this happens during the ‘quality management’ phase.

Project management has been used in a way to commence organisational change and is a transitory action that precipitates specific outcomes through the application of organisations resources and skill base (Stuckenbruck 1981). Just as managing change in an organisation is deemed crucial (Parker et al. 2013); it follows that the same can be said of project change. In order to facilitate change management there is need to establish the transitional process that makes up that planned

change, as those steps that create the actual change and those who implement the change process have to be committed to (Argyris 1993; Jones 1995). This essential buy-in commits the human resources to the task of the change management process that facilitates the outcome, particularly in project management. This can further be associated by considering the aspects of the employment of resources to undertake tasks and the associated outputs found with those tasks in project management, while change management considers the actual human resources and the outcomes (Parker et al. 2013).

The PMBOK guide goes further to clarify where change management fits within the context of planning, and states that change management is a subsidiary plan under the project management plan and entails determining where changes should be incorporated within the project management process (PMI 2013a). This may vary at the different stages of the project e.g. the Executing Process Group, or those that occur because of a comparison of planned work and measuring the effects against results achieved (PMI 2013a), for example, measuring budgetary costs versus actual costs. The focus of project management is clearly defined by the start and end of the project cycle while change management and continuous process improvements clearly have neither (Parker & Craig 2008; Winch et al. 2012). It would thus appear that change and project management would not be suited as they have differing perspectives of time. However, change management has shown to have greater success at implementing successful benefits especially in capital-intensive outcomes as found by Partington (1996). With project management, PMBOK states that knowledge, vocabulary, process tools and the application of techniques as being fundamental (PMI 2013a). The knowledge areas of integration, time, scope, quality, cost, human resources, risk management, communication and procurement are sub divided into two distinct groups of scope, cost, procurement, and scheduling as opposed to risk, integration, communications, quality and human resources. The former are measurable and can provide outputs as they are considered hard elements (Parker et al. 2013). The latter are the soft elements that affiliate with change management, as they focus on people within an organisation or within the project environment and hence can be seen to intersect (Parker et al. 2013). In the construction sector, changes are viewed as ‘work state, processes, or methods that deviate from the original construction plan…’ (Park & Pena- Mora 2003, p. 215).

Fundamentally, project management and change management are considered different but related. Whereby, project managers effect change through a methodical approach to identifying project tasks, scope, and undertaking activities to achieve deliverables that achieve a defined outcome (PMI 2012). Whereas, change management effects change by empowering people to change their behaviour and processes through a disciplined approach (PMI 2012).By integrating the two discrete disciplines the cross collaboration can benefit each other's disciplines and assimilate the core concepts.

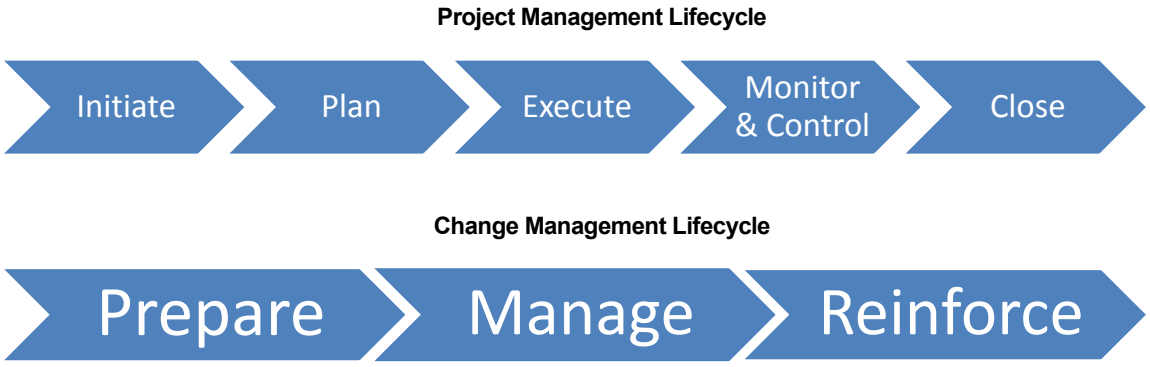


Figure 3.3 **Comparative stages of PM and Change Management Lifecycles (PMI 2012, p. 8)**

The integration of the two lifecycles can facilitate greater awareness of the specific roles, task and processes to be undertaken, as they will include the project deliverables, project scheduling requirements, resource levelling, risk management, critical path analysis, project delivery and post project reviews all within the project life cycle. Within the context of a construction environment implementation of changes are invariably associated to project design and as such managing those project changes requires mitigating potential negative impacts so as to assure project quality and profitability (Erdogan et al. 2005).

The potential ramifications of those project changes can vary based upon the scope of the change but more so from the project change management employed (Erdogan et al. 2005). Project change management within the construction sector is fraught with challenges when they are challenged by organisational structures that are managing one-off projects and may have global logistical challenges (Erdogan et al. 2005). One-off projects pose challenges for project change management as each project has unique interactions that are constantly changing. For project levels changes these are driven by both internal and external pressures and constraints so project change management must cope with both parameters (Erdogan et al. 2005).

Griffith-Cooper and King (2007) stated that project management was change and while PMI's PMBOK provides knowledge for controlling change, it does not address the human resource aspect of change. The aspects of change control, those aspects that are nonhuman related, are distinctly different from effecting change on human aspects within a project, which are effectively driven from a leadership perspective – project change leadership (Griffith-Cooper & King 2007). The connective nature of both change control and project change leadership has shown that they are interdependent and work together in order to achieve project performance success (Griffith-Cooper & King 2007).

Project change management is implementing changes that benefit the project so that the outcomes of the project are achieved when the deliverables of that project alone will not achieve that outcome (PMI 2013c). It is the project leader's responsibility to undertake these project changes and make sure they are adopted and integrated within the project to realise the benefits within the project life cycle (PMI 2013c). Throughout the projects life cycle there is inevitably change that will occur and it is essential that this is assessed. Change management within the project environment is seen to be predictable, and 'Due to the potential change, the development of the project management plan is an iterative activity and is progressively elaborated throughout the project's life cycle' (PMI 2013c, p. 94). Change management in this context is only considering those sources of project change that exist that are predictive in nature within the project environment and that can be included within the planning and implementation phases (PMI 2013c). It is imperative to understand that those predictive changes as part of the change management plan are no longer viewed as controlled changes to one that is focused on '…continued, cyclic review and adaptation' (PMI 2013c, p. 94).

The activities within project change management transcend all the change life cycle phases of the framework and commence during the planning change phase (PMI 2013c). However, project management must focus on implementing the change and on how these are managed during the transitional phase of the life cycle (PMI 2103c). As part of this process, it is essential to consider sustainability as well as, monitor the changing implementation needs of those changes being undertaken and feedback from the implemented changes (PMI 2013c). The aspect here that bodes consideration is that PMI fails to address is that not all change is predictable and can be readily planned for. PMI treats change as solely a predictive state and does not consider the reactive nature of change that occurs within the lifecycle of projects, such as changes in suppliers, project scope, or market driven forces that escalate costs.

Knowledge Area	Project Management Emphasis	Expansion Implied in Change Management
Project Integration Management	Managing interdependencies and unifying project components	Managing and unifying interdependencies with change management activities performed in program management Ensuring transition of project deliverables into operations for ultimate achievement of project, program and strategic benefit.
Project Scope Management	Clarity and limitation of scope	Soliciting input into scope before agreeing on limitations Planning scope as new information or challenges develop
Project Time Management	Completion of a project on schedule	Building adaptive and iterative processes into the schedule
Project Cost Management	Estimating, funding, and controlling costs	Ensuring realization of expected business benefits with project deliverables having reasonable cost structure
Project Quality Management	Ensuring quality of deliverables	Ensuring that quality deliverables result in expected business benefits
Project Human Resource Management	Organizing, leading and managing the project team	Ensuring and coordinating change management resources and activities for the project
Project Communications Management	Communicating project information to stakeholders.	Seeking participation of stakeholders in communication Delivering extensive two-way communications
Project Risk Management	Planning for and controlling risks to project scope, schedule, and budget	Planning for and managing risks, particularly those posed by peoples' actions and reactions Adapting project deliverables and outcomes as necessary, to ensure realization of expected business benefits
Project Procurement Management	Planning for, securing, and controlling contracts for products and services necessary to complete the project	Planning for, securing, and controlling contracts for services necessary to ensure change adoption and ultimate realization of expected business benefits Obtaining professional expertise in such areas as process design, organizational design, and knowledge transfer when applicable
Project Stakeholder Management	Engaging stakeholders in defining expectations, analyzing, negotiating, and managing expectations	Engaging broad range of stakeholders when defining expectations Seeking stakeholder participation in decision making Testing stakeholder assumptions

Figure 3.4 Change management and project management knowledge areas (PMI 2013c)

The intersection where project management and change management knowledge areas overlap is shown in Figure 3.4 above. The ten PM knowledge areas clearly denoted in the left column, while the emphasis as to the actual technical focus is stated in the middle with the corresponding change management overlap on the right. There is a clear intersection of the functionality of change management and how this fits within each of the project knowledge criterion (PMI 2013c). This provides a framework by which a project manager can adopt and undertake change within the project (PMI 2013c).

The PMI (2013c) framework raises two significant issues. First that formulating change is not necessarily the role of the PM within the change life cycle, and second, that 'When a project is part of a change program, clarification of the need for change is well developed…(PMI 2013c, p. 99). The issue of the PM formulating change would seem to be problematic as to who would be responsible for formulating change e.g. construction projects that have already commenced, if not the PM then who is better suited. Khan et al. (2014) stated that PM needed to implement greater project controls and planning to achieve greater project performance. Since Khan et al. (2014) found that change management and project control impacted on project time and that PM's could affect project performance by managing project control processes and project planning , it follows that PM's should be involved in project change formulation as it has an effect on project time of the project life cycle (Khan et al. 2014). This would seem to suggest that the PM is ultimately responsible for project change management and the implementation processes, so they should therefore be involved in strategy formulation of change.

Second, the fact remains that change often occurs during the project life cycle especially within construction projects like site conditions or project scope that is not already planned and thus the change may not be well developed (Bonhomme-Delprato 2008). Thereby, the framework and approaches suggested by PMI (2013c) are not always fit for purpose and must be understood by the limits they impose. Projects typically have to deal with change in a reactionary capacity, especially when costs spiral out of control (Lister 2005). Project change management occurs usually because of projects that have grown out of control or are a result of poor project management, which results in reactive and unplanned project changes (Lister 2005). Additionally, project change management can occur from poorly defined scope, deficient planning and inadequate estimation (Lister 2005).

Figure 3.5 shows the change management activities that occur across the five project management phases and what essential actions must be taken at each stage.

Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
Identify lead and other resources.	Collect change management requirements and define change management scope.	Acquire and organize change management team, including procuring outside resources, when applicable.	Assess change acceptance.	Measure change acceptance/adoption against established measures.
Identify stakeholders and their vested interest in the change.	Define, sequence, obtain resources and budget change management activities.	Manage change communications.	Review and modify change management scope, activities, project schedule, and project budget based on acceptance assessment feedback.	Identify, plan, and execute actions needed to transition the change into business operation.
Coordinate change management activities and program management activities.	Identify measures of benefit realization.			Close out the project with a plan for sustainability.
Delineate change management scope.	Clarify risks to change acceptance and adoption, and plan abatement activities.			
Begin change communication.	Develop communications management plan, human resource management plan, and quality management plan.			

Figure 3.5 Change management activities in project management process groups (PMI 2013c)

Another important aspect of project change management that must be noted is the quality of the communication between the people involved in the change. Knowledge is often present in the employees, but is not used in project change management due to the lack of communication (Meyer et al. 2007). In order to ensure that all available knowledge and resources are used, communication between people must be facilitated (Oakland & Tanner 2007). Communication can also increase understanding of one's roles and responsibilities in the change process, which can allow ownership and resolution of the issues, which may arise during the change process.

In summary, project management is an alignment that provides individuals or organisations with a significant set of tools that are intended to improve their ability in designing, carrying out, and

managing activities to achieve specific organisational objectives (Larson & Gray 2010). Project change management promotes better skills in the planning, execution and management of an organisational project or activity, greatly assisting the organisation through its project managers to arrive at its primary and ultimate goals by including predictive planning within the project phases.

3.3 The relationship between constructs

Different elements in project management are interrelated in several ways. Interfering with the effectiveness of one may lead to the collapse of other elements (Meyer et al. 2007). For effective and efficient project management, all these elements should work as suggested in the sections below.

3.3.1 Project management leadership & project management staff

Leadership in project management is a critical aspect that determines the effectiveness of the entire project team (Oaklanda & Tanner 2007). Leadership in project management can be understood by several major that can be applied to project management. Hodgkinson (2009) suggested four decision-making styles of leadership: *autocratic, consensus, democratic* and *laissez faire*. With the traditional notions of *transformational* and *transactional* based leadership as suggested by Burns (1978) and augmented and refined by Bass (1985), an additional leadership suited to project management has emerged that of *servant leadership*.

Transformational leadership

It has been widely held that *transformational leadership* in project management has a significant relevance given its intrinsic nature to nurture employee motivation, openness of communication, and levels of commitment (Keegan & Den Hartog 2004). A plethora of leadership literature exists (Burns 1978; Bass 1985, Bass & Avolio 1990; Bass & Avoilo 1997; Vroom & Jago 2007) that has discussed, debated, and analysed leadership in an attempt to identify traits, characteristics and the salient value of differing styles. The complexity of a leader's role means it is hard to define what makes a good leader and thus what intrinsic attributes are required. Skipper and Bell (2006) state that it is complexity that brings about the lack of understanding as to what constitutes an effective leader.

If we consider the ideas suggested by Barber and Warn (2005) and the need for proactive anticipatory leadership as ways to drive project direction and success, this visionary aspect would

seem to support the need for transformational leadership in project management as noted by Gehring (2007), to avoid potential crises before they arise. The goal of transformational leadership is to 'transform' people and organisations in a literal sense – to change them in mind and attitude; increase vision, insight, and understanding; clarify purposes; make behaviour congruent with beliefs, principles and values; and bring about changes that are permanent, self-perpetuating, and momentum building (Henricks 2010). The goal of the transformational leader is to change the ineffective to the effective. The latter would make changes to ensure the effectiveness, growth and outcome benefit the corporation.

Transformational leadership is the style of leadership in which the leader identifies the needed change, creates a vision to guide the change through inspiration, and executes the change with the commitment of the members of the group. Crawford, Hobbs and Turner (2006) went further to explain transformational leadership as the process whereby a person engages others and creates a connection that raises the level of motivation and morality in both the leader and the follower. It ensures that the team leader and the staff work together for a common goal. In this form of leadership, motivation is a key element (Belout & Gauvreau 2004). For a transformational leader to be considered effective, it falls ultimately on the followers following rather than leaders leading (Dulewizcz & Higgs 2004). Without the right staff, transformational leaders would be ineffective and eventually fail in their quest.

Servant leadership

Conversely, the second style of leadership under consideration as a way to lead successful projects is *servant leadership*, whereby individuals work to provide for, or serve others to accommodate their needs, and to conduct these activities in a leadership capacity throughout the project lifecycle (Brewer, Garrison, & Noreen 2008). A servant leader has a complex responsibility, one that reflects a number of inherent personal values and beliefs regarding the ability to provide and show direction for the team in the project (Henricks 2010).

There are a number of key elements in *servant leadership*; these include empathy, listening, healing, and stewardship. These are critical factors in supporting the project in hand (Allen et al. 2007). The team cannot carry out the activities in the project without effective and dedicated *leadership*. In general, *servant leadership* requires an individual with the ability to adapt to change

quickly, to work with many diverse groups of people on the project, and to develop leadership skills through training and experience. Finally, those in *servant leadership* roles must set a good example for others through their actions and core values under all possible conditions and with diverse population groups (Henricks 2010).

These two forms of leadership bring together the entire workforce in the project for a common goal bearing the same vision of the project (Harper 2007). Barcan (2010) argued that both *transformational* and *servant leadership* styles are aimed at creating a working environment that is friendly, conducive and one that all members have changed to make their necessary contribution to the success of the project (Hbreniak 2005). Contrary to *transformational leadership*, group morale is not something that is at the forefront of a *transactional leader*'s mind (Arvidsson et al. 2007). The behaviours and attitudes of transformational and servant leaders have been shown to promote teamwork and effective communication among project team members, enhancing cooperation among the stakeholders in the project. Promoting good relations within the project team ensures that all members are motivated and are directed towards working for a common goal (Harper 2007).

3.3.2 Project management leadership & project change management

The concept of *change leadership* is explained as a means of promoting effective outcomes in a leadership role that are based upon the ability to change as needed to accommodate an organisation or group (Cummings 2008). Leaders must establish the appropriate tone for an organisation in carrying out the designated projects and should strategically emphasise how change can shift the direction of the organisation in positive or negative ways, and how this improves the capacity to learn new tasks and knowledge (Hbreniak 2005).

In a leadership capacity, an individual must continuously strive to develop his or her strengths, minimise weaknesses, and adapt to change quickly and effectively (Allen et al. 2007). Flexibility – the ability to change – is a critical trait that the project management team should possess. It ensures that the group works towards common goals and a common target. The changes arising from the project may interfere with the actual progress either positively or negatively. Risk analysis of these changes must be evaluated and anticipated problems solved (Cummings 2008).When change is warranted, a leader must establish a means of promoting the change effort throughout the

organisation, and this is accomplished by motivating employees and enabling them to see the advantages of the change effort in question (Crawford, Hobbs & Turner 2006).

When a leader assumes this role, it is necessary to develop and promote a vision that will engage employees or team members, while also recognising that the world is not static, and that constant change is a constant and sometimes necessary to improve upon existing processes and strategies to enhance performance and achieve the desired objectives (Belout & Gauvreau 2004). If a leader can adapt to these changes effectively, he or she possesses a greater chance of improving the existing state of the organisation on a consistent basis, and this demonstrates his or her own strengths as a leader in important ways (Hbreniak 2005). Finally, change leadership is an important responsibility for all leaders to meet and to satisfy, because these efforts make a significant difference in the lives of those that are directly impacted by these changes as they arise (Henricks 2010).

One of a leader's most important skills is the ability to mobilise commitment to a new vision and translate that into effective action (Hbreniak 2005). Spector (1989) from his study of six organisations undergoing revitalisation noted that the appropriate organisational context was essential for effective behavioural change. This argument assumes that transformational leadership change can only be effective when it creates an environment that enables behavioural change. The behavioural focus is not on individual aspects of behaviour, but on creating an atmosphere for change (Spector 1989). An effective leader will focus on this larger aspect of behaviour rather than individuals because this can result in levels of dissatisfaction (Spector 1989). Transformational leaders who experience levels of dissatisfaction must overcome this in order to drive and sustain organisational change (Cummings 2008).

The use of emotional language and positive expressions in their communication compels followers to support the vision of the future painted by transformational leaders (Allen et al. 2007). The use of emotional elements in a leader's communication is highly effective in persuading people and overcoming resistance to organisational change. Research by Cummings (2008) showed that emotions experienced at work affect motivation, organisational citizenship behaviour, and performance appraisal and negotiation outcomes. The most important element contributing to effective communication is the trust employees feel toward the leader and as a result the change process (Belout & Gauvreau 2004).

Leaders that engage in transformational behaviours by applying the 4Is (idealised influence, inspirational motivation, individual consideration and intellectual stimulation) are able through communication skills to convey 'life after the change' and excite followers to heightened performance (Fiss & Zajac 2006). When followers' personal identification with the leader is high, shifting their immediate concern to a change-commitment promising a better future becomes more feasible (Harper 2007). Followers are able to see a higher, more important vision and are willing to do extraordinary work to achieve it (Weber, Reichert & Rinderle-Ma 2008).

However, the leaders' ability to communicate, their passion and ability to arouse a strong need for change may be called into question, depending on their intentions in promoting the change (Levine 2005). Leadership is a value-laden subject and while charismatic and transformational leaders are revered for their ability to gain support of their followers with their perceived trustworthiness and competence, with a perverse agenda, they are able to cause disorder and devastate an organisation (Cummings 2008).

Although the importance of building leadership strength by building a network of leaders at all levels of the organisation is proven, charismatic leaders, who are driven by personal motives to resist change and defend the status quo can pose a major obstacle to the proposed change (Cummings 2008). Organisational change can cause anxieties and/or challenge the interests of influential groups and if the needs of work -groups are not given consideration, it may produce an internal crisis and derail the change initiative of the organisation (Cummings 2008).

3.3.3 Project management leadership & project management policy and strategy

In project management, leadership, policy and strategy are three interdependent influences. They link the way different team members operate in terms of their leadership skills and their ability to handle the tasks inherent in the change plan (Dulewicz & Higgs 2005). The success of a project requires foresight and detailed strategic planning (Schoemaker 1995; Gates 2010). The process of planning is the effort to project the goals forward in time and anticipate those actions that must take place in order to achieve them.

Project planning can be broken into three hierarchical levels – strategic, tactical and operational (Orthouse & Dulewicz 2007; Zapata, Varma & Reklaitis 2008; Hans et al. 2007). The size of the

project will regularly dictate the degree to which these levels are separated; however, an overlap is nearly always seen, barring the presence of a rigid bureaucracy (Orthouse & Dulewicz 2007). On larger projects, each level may have its own managing team or individual to provide greater focus for the planning process, thus very little overlap occurs (Orthouse & Dulewicz 2007). Conversely, those that are smaller will find these levels compressed and a single manager could be responsible for two or all three levels of planning. Strategy involves establishing goals, determining workforce strengths, identifying required resources, and developing policy objectives (Cummings 2008).

Strategic

By utilising clear and concise mission statements and a corporate vision, the core of a project's strategic concepts can be understood and implemented down to the operational level. Without planning at this level, the project would become stagnant and growth would be untenable or lead to collapse (Jamieson & Morris 2004; Crawford, Hobbs & Turner 2006). Strategic management efforts are future-based and flexible enough to address changes in the economy, the market and their specific industry. Within the strategic level of project planning there are three sub-levels – corporate, business, and functional – and, like the larger planning model, these too may overlap to varying degrees depending on the project's construction (Dulewizcz & Higgs 2004). Considering strategic planning within the context of establishing or sustaining a competitive advantage it is essential to align strategic planning with actual implementation (Patton & White 2002). Wessels (2007) suggested that organisations must adopt strategic planning with project management as means of realising this advantage, and that it is essential to align strategic planning, by establishing strategic goal setting and implement project management to achieve this.

Tactical

Management at the highest planning levels requires senior management to redefine the company's function through a cyclic analysis of the following four steps – environmental scanning, strategy formulation, strategy implementation and evaluation. Initial information, statistics and any other data relating to the project are collected and analysed (Brewer, Garrison & Noreen 2008). It should be noted that this step must be constantly repeated in order to improve service, production, and profits. Once this step is complete, leaders can begin to establish various courses of action (Dulewizcz & Higgs 2004). Contingency planning, or war-gaming, allows strategists to play out

the possibilities and potential solutions without risking project stability or capital. Once the best courses of action have been identified, managers are able to formulate and categorise the strategies into planning for action at all project levels (Crawford, Hobbs & Turner 2006). Tactical planning serves to achieve project based objectives, especially when incorporating management practices (Bolles & Hubbard 2007).

Operational

The next step in the process to be implemented is the act of turning a planned course of action into real action. This is the 'doing' phase of the process and will ultimately require an integrated effort at all levels. This step may include structural design, resource distribution, human resource management and establishing project based decision-making procedures. Finally, the active strategies must be evaluated to ensure they are supporting expected objectives (Harper 2007). The key to success in this area is maintaining a vigilant watch over internal and external factors affected by the strategies, evaluating performance levels and modifying the corporate mission if needed. In order to accomplish this, those involved in the strategic management process must seek out feedback throughout the project so that this input can be applied to future decision-making (Harper 2007).

One of the most vital components of strategic management is the establishment, distribution and enforcement of the organisation's intangible goals (Cumming 2008). Often times these will be represented by a corporate mission statement, a company vision or a unifying philosophy. Each project may choose to use all of these separately or just focus on one. There are also examples of the various portions of larger projects having their own specific version of statements, but at the core of every organisation should exist a 'final intent' that drives everyone toward a common goal. That being said, simply writing a vision, mission or philosophy is not sufficient. Once drafted, they must be communicated to and understood by every employee (Cummings 2008).

3.3.4 Project management leadership & project management partnerships and resources

The project management performance assessment (PMPA) model as advocated by Bryde (2003a), whereby the six criteria, including project management leadership and project management partnerships and resources, constitute two of the criteria, was examined for correlations by Qureshi, Warraich and Hijazi (2008). Qureshi, Warraich and Hijazi (2008) determined the interrelatedness of these criteria in project performance and found that project management leadership had an

immense amount of impact on project management performance (PMP), and that project management partnerships and resources had a significant impact. The integration of these three specific attributes leadership, partnerships and resources can best be explained by the fact that they are co-dependent. The leader integrates the team, the resources and the partnerships, assimilating the independent disciplines of each member into a cohesive unit (Harper 2007).

The outcome of the project is highly dependent upon these relationships. The Office of Government Commerce (2007b) stated that there were two types of partnerships – project and strategic – with project partnering involved in integrating the supply chain and client organisation on individualised projects, while strategic partnering was directed toward them working on continuous improvement. Strategic partnering provides the greater value, built over time through trust and extended cooperation (Ronco & Ronco 1996). While project partnering is seen as short term and tactical (for the life of the project life cycle), strategic partnering is a long-term proposition with a level of maturity achieved through the shared vision. It evolves through different stages, and realises significant financial benefits (Thompson & Sanders 1998). A high level of trust is integral to partnership success, without which there can be no realisation of financial gains or innovation (Brewer, Garrison & Noreen 2008).

Partnerships offer an opportunity to share resources and can afford several types of partnering, such as co-location and sharing in the utilisation of resources, by which costs are reduced, efficiencies increased, waste reduced, as well as duplication, and opportunities to implement new theories or practices. However, throughout the project(s) life cycle and partnerships, the trust based relationship will be one that can be challenged, especially in crises where arduous decisions are to be made (Cummings 2008), thereby, straining the partnership.

In situations like this, project leadership and member relationships are tested as the project team, its leader and the organisation have shared a similar vision in the strategic partnership and have collaborated based upon that shared vision with a view to creating specific organisational benefits, and now may be faced with challenges to that relationship (Fish & Zajac 2006). Forming partnerships enables the sharing of resources enables project leaders to have an increased array of talent at their disposal through the breadth of the partnership that might not otherwise be possible; this too can work to achieving project success (Crawford, Pollack & England 2006). There are specific advantages that project leaders can expect according to Tennyson (2004) (Table 3.1).

Table 3.1 Specific advantages that project leaders can expect

Management Option	Advantages
Centralised Management (e.g. project management by a partner for another albeit a project or partnership)	• Maximum efficiency • Unambiguous decision-making procedures and day-to-day management systems • Familiar / conventional management approach • One-stop shop" for external agencies / individuals • Quicker response time
De-Centralised Management (The sharing of different aspects of management by the partners).	• Maximum diversity at operational levels • More opportunities for individual leadership • Shared sense of ownership" • Moving away from conventional 'power bases' • Greater freedom of operation
Management by Mandate (Specific task allocation by situation to individuals or partner organisations with a centralised accountability to the partnership group).	• Allows for those who have most time (or care most about the task) to be given the role • Highly flexible approach that can be reviewed and changed as often as necessary • Shares tasks between partners and promotes a sense of collective responsibility

3.3.5 Project change management & financial management

In the process of implementing the changes inherent in the project, the financial implications of must be critically considered (Thiry 2007). There is a direct link between project change and financial management. Financial management and analysis has to be carried out whenever a change within the project is proposed. It ensures the project budget and allocations correspond to what changes can be brought about. With project planning, resources are assigned to different tasks in the project (Cummings 2008). The changes arising in a project may arise due to changes in technology, economic fluctuations and changes within the project team. As a result, the development will always influence the financial management across the lifecycle of the project.

Change is typically always met with resistance. The people involved in the project will generally not like change for a number of reasons. These include fear of the unknown and the effort required within the project environment (Brun 2011). The most critical element to successful change management is the process of acquiring the support of the stakeholders, particularly senior management (Heravi and Ilbeigi 2012; Kerzner 2013). It ensures that the staff are informed about the change, consulted and given an opportunity to provide their input and feedback (Cummings 2008).

Project change management should not be seen as something automatic and consistent because there are many internal and external factors serving as pressure to change the project in an organisation. Realising sustainable growth is a significant challenge (Slapper & Hall 2011) and recognising profitable growth is difficult and influenced by many elements (Kimmons & Loweree 1989; Silvius, van den Brink & Köhler 2012). In order to achieve this, it is necessary to enact change, for example, when a project is failing because of financial management like that of the projects at British Airways, which undertook a change management approach to alleviate bankruptcy (Lawton 2011), thus illustrating the value change management can have in affecting project outcomes (Cummings 2008).

When project changes are undertaken, they are expected to reduce costs in a project until its completion. However, changes invariably involve cost overruns to the budget besides delaying the project; therefore, the most cost effective time to implement project change to realise is during project design or planning phases (PMI 2008). Before the changes are made within the project, it is essential for the team to analyse the financial implications of such changes (Brewer, Garrison & Noreen 2008). When changes are proposed, it is essential to consider the available financial support for the project within the scope of the project's budget. Furthermore, project change management policies should always look to consider the financial problems that may arise as potential changes that could be implemented during the project (Cummings 2008).

Project change management and financial management in the running of the projects are two critical interdependent items. They affect both the short-term goals and long-term objectives of the project (Orthouse & Dulewicz 2007). Evidence shows that there is a close link between project changes and finances. In the case of an economic recession, the strength of the currency may weaken; hence, this may influence the financial cost of the project in terms of resource costs. Through project management skills, the team is motivated and encouraged when there are clear guidelines on the effects of the changes on the financial health of the firm (Dulewizcz & Higgs 2004). Typically, change management is considered through the soft issues, such as leadership, motivation and culture, but frequently they are insufficient in transforming projects to have a financial effect (Sirkin, Keenan & Jackson 2005). Transformational actions are intended to change and to achieve financial results e.g. By reducing a projects cycle time or by eliminating staff this

can reduce costs (Sirkin, Keenan & Jackson 2005). Implementing projects can be undertaken as part of a program overhaul to increase profitability; however, there may be significant financial implications for those projects that are to create that change, whereby the financial risk of implementing the changes associated to each project could outweigh the cost benefit (Sirkin, Keenan & Jackson 2005).

In order to affect project change to increase the return on investment (ROI) it has been held that *change enablers* are critical, whereby the enablers adopt standardised project practices, engagement of project sponsors, a commitment toward change, and the management of staff through the change processes (Cabrey & Haughey 2014). These change enablers are seen as being able to harness project value given increased understanding, thus enabling a greater financial return (Cabrey & Haughey 2014). Projects that realise change enablers not only increase the financial returns of projects, but also avoid pitfalls of potential failure. Those projects that fail and realise significant financial losses, also fail to achieve a strategic objective and this impacts on organisational culture, processes, systems, and the sustainable legacy is that there is potential to lose competitive advantage (Cabrey & Haughey 2014).

Financial management also consists of well-structured financial documents, including the financial statement that shows information on the flow of finances across the project. It may be possible to detect any malpractice in the finances by examining the information contained in the statements of accounts. Well-structured financial accounts make it easier to track the flow of money in and out of the project and establish the foundation for the change transition as the project draws to its conclusion. Such considerations show the importance of developing a clear structure between project change and financial management in project management (Crawford, Pollack & England 2006).

3.3.6 Project management lifecycle process & project management performance indicators

The process of managing project performance involves focusing the strategic plan on social outcomes, identifying value drivers, focusing managerial attention on activities, which contribute most to value and are easiest to influence (Harper 2007). This is achieved by tying metrics to value drivers, and measuring progress across a balanced scorecard (Harper 2007). It also involves defining and mobilising meaningful performance targets that ensure that the entire organisation focusses on the same priorities.

Additionally, performance management entails clearly assigning accountability for setting targets and effecting change, which can help the project team achieve strategic objectives in addition to optimising resource allocation in action-oriented plans (Crawford, Hobbs & Turner 2006) or driving value by making best use of strategic planning and budgeting.

Managing performance entails monitoring performance and progress and this calls for evaluation or measurement of management (Hbreniak 2005). In the public sector, economy, effectiveness and efficiency (the 3Es) are often used to measure performance (Otrusinova & Pastuszkova 2012), but must be used, like all measures, with caution and common sense. Accountability for economy enables the agency to know how much it has to spend and on what the money should be spent (Crawford, Hobbs & Turner 2006). However, many project managers in finding out that they have not spent all that they have at their disposal at the end of a financial year end up spending the balance disproportionately, making economy and ineffective indicator for a public agency since the spend does not reflect the reality of the situation (Belout & Gauvreau 2004). There are also challenges in the measurement of effectiveness because the concept is ill defined from the outset.

Nevertheless, performance indicators like construction costs, building time, defects, client satisfaction with the product and service, profitability and productivity, promote result-orientated thinking, just as predictability of design, construction cost and time, and safety can be considered require-process-oriented thinking (Cummings 2008). There are however no indications of performance indicators in benchmarking projects at the project selection phase in projects in Saudi Arabia, i.e., analysis phase, when the client and end user's needs statements and the delivery strategy are determined.

Ideally, in project management, the performance indicators for the project are well defined so that they can be checked at each stage of the project lifecycle. With these processes in place, errors occurring in the initial stages of the project can be caught and solved before it is too late, since early errors tend to flow through the whole fabric of the project by the end. Performance indicators and their corollary, milestones, also ensure that the projects run according to the planned cycle and process (Crawford, Hobbs & Turner 2006).

The five stages of the project lifecycle (PMI 2013a):

- project initiation
- planning
- implementation
- monitoring and control
- the closing stage.

Each of these stages has clear guidelines on how it should be carried out, as well as the necessary measures and tools to determine project progress and performance. The stages of the project lifecycle define project performance and effectiveness. In the initial stages, teams are built and the success of creating evaluation and process tools determines whether the other stages will be successful (Brewer, Garrison & Noreen 2008). Even with a good beginning, however, each stage possesses its own set of threats and weaknesses and requires monitoring to avoid pitfalls. Currently, most projects fail before completion due to a lack of project management skills to facilitate monitoring and the correction of problems before they affect the next stage of the project. Developing a clear structure of performance indicators is shown in Figure 3.6. In this diagram below the project initiation phase corresponds to 'starting the project', while PMI's planning is the organizing and preparing, the implementation and monitoring and controlling stages 3 and 4 are the carrying out the work phase, and lastly the closing stages.

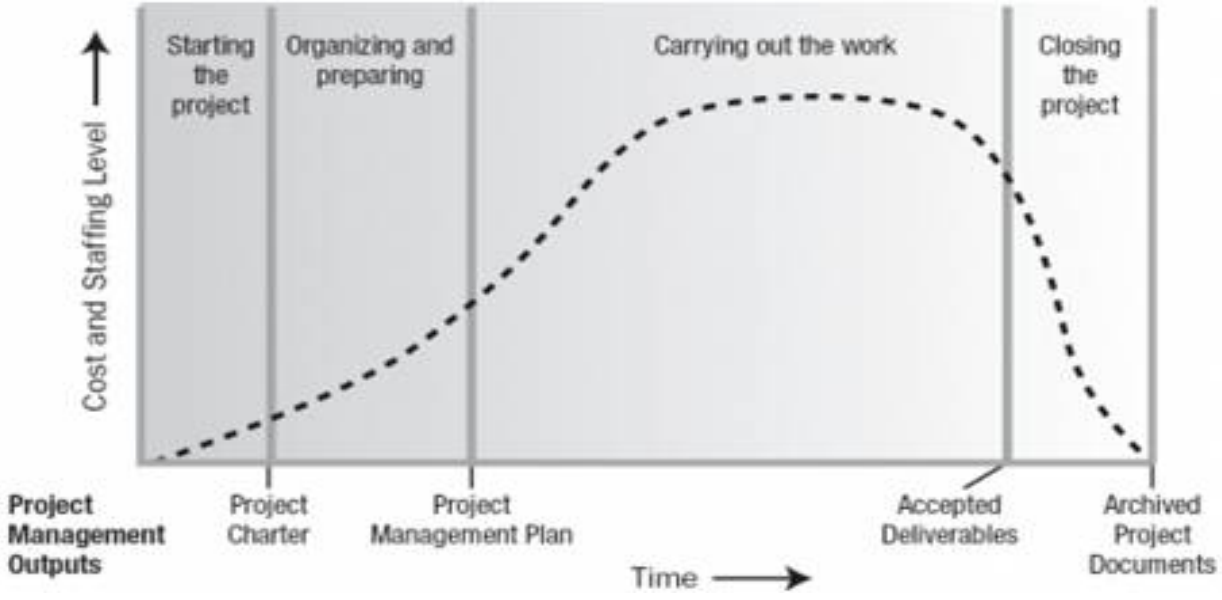


Figure 3.6 **Project performance and project lifecycle relations (Weber, Reichert & Rinderle-Ma 2008)**

Performance indicators should be evaluated at each stage of project development with the most crucial key performance indicators in project management being applied throughout the project lifecycle including its value, efficiency, speed, innovation, complexity and the impact on the intended group or society (Dulewizcz & Higgs 2004).

3.3.7 Project management staff & project management lifecycle process

The project staffing consists of both full-time and part-time resources assigned to operate on the deliverables of the task. This includes the analysts, designers, software engineers, who are responsible for (Barcan 2010):

- interpreting the work to be finished
- planning the assigned activities in more detail if required
- completing assigned work within the budget, timeline and quality prospects
- informing the project manager of issues, scope changes, risk and quality businesses
- proactively communicating status and managing expectations.

A cross-operational team has members from multiple systems. Having a cross-functional team is usually a sign that your system is using matrix management (Ahmed 2008). The project staff are involved at every stage of the project lifecycle as they are actively engaged in carrying out the tasks that are planned throughout the project (Anderson 2010). The *responsibility matrix* is a tool employed to determine the general duties for each role on a project (Barrow & Mirabella 2009). The matrix enables a clear delineation that can be used to communicate the roles and responsibilities to the appropriate people associated with the team. This helps lay out expectations and ensures people know what is required of them (Barrow & Mirabella 2009).

Five stages of group development

The evolutionary group development of staff within a team can be described by Tuckman's f*ive stages of group development*, which nominates the stages staff go through as the project evolves (Berg & Karlsen 2007). Tuckman asserted that each of the initial four phases, a decade later he added the fifth phase, were a requirement for team growth, to face the challenges of planning work, problem solving, so as deliver objectives and results (Tuckman & Jensen 1977). These model stages are seen as a path to achieving high performance.

The five stages are (Berg & Karlsen 2007):

- forming
- storming
- norming
- performing
- adjourning.

These developmental stages in the teams formed to implement the project proposal require maximum cooperation and interaction across the project lifecycle (Bresnen 2005).

Forming

Forming is the act of coming to together (Berg & Karlsen 2007), by forming a group of people who may be alike or the complete opposite from one another, means that you will have diverse talents and attitudes that could enhance project success by bringing alternative ways of looking at project tasks. However, a diverse group of multi-talented people requires an excellent leader to perform at their best, someone who can achieve cooperation and respect among team members without dampening their enthusiasm or creativity. The team, after all, will be the basis for the project's success (Besner & Hobbs 2006). Initially, the team will be dependent on their project leader to unify them, move them in the right direction and help them establish their roles and understand the project objectives.

Storming

Storming is focussed on ideas, goals, objectives, and relationships. Good leaders will use goals and objectives to alleviate relationship distractions, and compromise can begin. Poor leaders may find group members ascending to a position of natural authority in the group, which will produce problems as the project progresses (Besner & Hobbs 2006).

Norming

Norming is the stage reached where the team is established. Teams can accomplish most of the duties set at each stage (Barcan 2010). Agreement and group consensus has emerged. The group members have clearly delineated roles and responsibilities, and, if the storming stage has gone well, the group will be cohesive and ready for group decision-making and agreement. Ideally, team unity and a distinctive working style will emerge during this phase as the group develops processes, along with a respect for the leader and one another.

Performing

In this stage, the team has strategic awareness of the project's objectives and understands the vision and the project tasks and goals. As a group, their performance at this stage may be the most important during the period of group development (Orthouse & Dulewicz 2007) and last the longest. Ideally, the group desires to excel and achieve and delivers on the established goals that have been cohesively determined with the leader. At first, it may seem very hard to balance objectives as a group, but over the long-term, performing becomes a strength (Thiry 2007). The group is not only able to realise objectives, but manage the group relationships and processes, too. The team leader (project manager) delegates the required tasks and minimal if any instruction or assistance is required by the group.

Adjourning

Is the final stage where the team breaks up upon project completion, having delivered the project tasks and ultimately achieved the project objectives. Project teams by definition typically exist for a short duration but also, when an organisation undergoes restructuring permanent change can result in in adjourning. Typically this stage can be seen to be hard to cope with by teams who foster routine, close collaboration with team members, and because the future status seems uncertain.

3.3.8 Project management policy and strategy & project management lifecycle process

The policies and strategies imposed on the project are implemented at different stages throughout the project lifecycle. They determine the success of every aspect of the project. For clarity and efficiency, each policy or strategy should be well defined during the development process of the project for the stage at which it will be applied (Arvidsson et al. 2007).

Project strategy is the approach developed to achieve the objectives, which have been defined. The development of the strategy is a critical part of long-range planning (Shenhar et al. 2007).

Operational policies are guides for decision-making (Berg & Karlsen 2007). The operating policies of a project flow out of its objectives, its strategy, and its organisation. This provides a framework within which management can make decisions that are consistent and are in accordance with the strategic plan and its objectives (Barcan 2010).

Strategic analysis and choice means identifying strategies that are the most efficient at building a sustainable competitive advantage based on key value chain activities and capabilities – the core competencies of the firm (Patton & White 2002). The majority of a project manager's focus is on determining which combination of activities will maximise value to the stakeholders during their strategic analysis and choice (Berg & Karlsen 2007). Many businesses explicitly and all implicitly adopt one or more generic strategies characterising their competitive orientation in the market place. Low cost, specialisation, or focus strategies define the three fundamental options of generic strategy (Van de Ven & Poole 2005).

Action plans translate the strategies into an action by incorporating four elements. Foremost, they identify the specific functional tactics and activities to be taken on in the following week, month, or quarter as part of the effort to establish competitive advantage in the market (Berg & Karlsen 2007). The second factor is a clear time model for the completion of the project. Third, action plans create accountability through identification of the person responsible for each action in the project. Fourth, each action in the action plan has one or more specific and immediate objectives that are identified as outcomes that action generates (Berg & Karlsen 2007).

3.3.9 Project management policy and strategy & financial management

Project financial management is important to all project managers because it provides the skills project managers need to identify and select the project strategies and individual projects that add value to their organisations. Corporate finance assists project managers in forecasting the funding requirements of their organisation, and formulating strategies for the acquisition and deployment of these funds (Brown 2008).

Strategic financial management is the portfolio component of the corporate strategic plan that covers the optimum investment and financial decision making required to meet the overall specified objectives. This apprehension can be used in identifying the relationship between project management policy and strategy and financial management (Chabursky 2005). In this association, it is necessary to distinguish between strategic planning, tactical planning and operational financial planning in project management. While strategy is a long-term course of natural processes, tactics are intermediate. Operations are short-term functions within the project. The high-level project management team devises strategy; middle level teams decide tactics and operations are looked after by line management (Barrow & Mirabella 2009).

Since capital is the determining factor, the strategic problem for financial management is how limited funds are allocated between alternative uses in the project. Strategic financial management is the use of four major components based on the mathematical concept of expected NPV (net present value) maximisation – financing decisions, investment decisions, dividend decisions, and portfolio decisions (Barrow & Mirabella 2009). In achieving the financial management targets of the project, it is important to look at the financial preparation, as this is instrumental for project planning and corporate planning. Financial preparation forms the framework for a systematic plan of attack, whereby the financial planner helps the client to maximise their existing financial resources by using financial tools to reach financial goals (Barcan 2010).

The consequences of financial planning are the financial objectives, financial decision-making and fiscal criteria for the valuation of the project execution. Financial objectives should be clear from the beginning stages of a project and integral to the budget. Financial objectives need to be coherent and appropriate for the project mission and corporate targets.

Organisations require sufficient capital to sustain business operations and undertake new expansion projects such that they must either have cash or have access to the capital requirements necessary to invest in the project without compromising the existing operation (Meyer et al. 2007). Sources of finance and capital structure are the most important dimensions of a strategic plan. Fund acquisition to support the expansion activity of the firm is vital for any project. The mobilisation of funds may come out of ownership capital or borrowed capital for the project. An organisation may plan to issue equity shares or preference shares for mobilising ownership capital and debentures to raise borrowing capital. Public deposits, for a fixed time frame, are also raised as a major source of the short and medium term finance (Barcan 2010).

Organisations may offer higher rates of interest than banking institutions to attract investors and raise funds. An overdraft, cash, credits, bill discounting, a bank loan and trade credit are the other sources of short term finance (Barcan 2010). Together with the mobilisation of the project finances, policy makers are expected to decide on the capital source structure that indicate the desired mix of equity capital and debt capital. Some of the norms are related to debt and equity ratio, which need to be followed for minimising the dangers of excessive loans. For example, in public sector projects, the norm is always 1:1 ratio, while the private sector firms the average is usually 2:1 ratio

(Brown 2008). Additionally, the given ratio in its ideal form varies from industry to industry. It likewise depends on the planning mode of the organisation (Brown 2008).

For capital-intensive industries, the proportion of debt to equity is of the utmost importance. Likewise is the case for high cost projects in priority sectors and for projects in underdeveloped countries. Some other important dimensions of the strategic management and financial policy interface are the investment and fund allocation decisions (Belout & Gauvreau 2004). A planner has to set up policies for regulating investments in fixed assets and for restraining of current assets. Investment proposals are mooted by varying business units and may be split into three groups. One case of the proposal will be an addition of a new product by the firm. Another case of the proposal will be to increase the level of functionality of an existing product through either an increase in the capacity of the existing plant or plant for meeting additional capacity requirement (Besner & Hobbs 2006).

Financial decision making forces organisations to recognise challenges to successful outcomes and aids in helping them decide on the form of action to be taken or strategic decisions to be applied to maintain or correct the financial position of the project (Besner & Hobbs 2006). Fiscal measures, like ratio analysis or the analysis of cash flow statements are applied to assess the fiscal health of the task and monitor the progress of the project aims (Anderson 2010).

3.3.10 Project management partnerships and resources & financial management

The aim of strategic planning in project management is to provide a roadmap for the advancement of the project. With a good business road map, one should be able to wipe out areas of inefficiency and ineffectiveness (Rigby 2005). When this takes place, there are greater financial resources at an organisation's disposal. This implies you receive a bigger budget for the next budget period and may be able to accomplish more than you managed earlier (Besner & Hobbs 2006). Project managers look at this as evidence of stability and development. Ideally, strategic and financial planning is always intertwined in a task, acting together in a cyclic manner. Any modification to your budget necessitates a re-evaluation of the current strategy in place. Sometimes budget changes are substantial enough to either force or inspire managerial change. In the desire to change the strategy, one must first confirm that there is sufficient money and devise ways of meeting the financial requirements (Berg & Karlsen 2007).

Finance can be a beginning of great strength in building distinctive competitive advantages to a task. Companies that manage their inventory, debtors and creditors will improve their cash flow and reduce both operating and borrowing financial expenses. The organisation developing the project can borrow at competitive rates with reduced interest payments to a substantial extent. Large finances help organisations to proceed in advance of competitors with confidence. Financial strategies can be leveraged to increase the returns for shareholders. They can, therefore, increase the scale of their operations and gain significant tax concessions through mergers and acquisitions (Allen et al. 2007). Therefore, project teams that manage their funds well can build distinct competitive advantages over a period of time.

Creating effective and mutually beneficial partnerships is one way in which the project team can achieve substantial growth and develop their set goals. A task has many alternatives while raising funds, such as equity shares and term loans from leading financial institutions, unsecured bonds, fixed deposits, partnerships and bank finance for working capital demands (Barrow & Mirabella 2009). All these funds cost, either explicitly or implicitly, as in the example of a dividend on equity. The weighted average price of all the funds garnered should be maintained as low as possible. If the cost of financing the project becomes very high, the organisation carrying out the project will decrease in profitability and hence growth prospects suffer.

Another issue to consider is the time factor. Time is money for a project, and the time spent gathering funds should be accounted for in the project. A project should not be started if timely infusions of capital cannot be accessed. Capital markets, as a rule, run through a cyclical pattern — boom, recession and recovery. In economic booms, capital investment is realised from equity markets to fund projects, while during recessions project funding is obtained from bond markets (Milford et al. 2014).The right time setting is essential for capital issue; hence, it is crucial when mobilising the funds from various sources (Crawford, Hobbs & Turner 2006).

Other important financial management issues relate to dividends through partnerships. The objective is to strike a fine balance by paying reasonable finances to partners who are counting for a steady income on their equity investment and those partners who require the company to put any surplus from one project into another with great growth potential (Besner & Hobbs 2006). Every task should bear a healthy dividend policy (whether to pay dividends or retain the surplus for

expansion, modernisation etc.) To meet the demand for cash, the company has also to satisfy the expectations of the partners (Barrow & Mirabella 2009).

Experts generally arrange for a stable dividend partnership wherein dividends are declared every year as a kind of reward for loyal shareholders (Fish & Zajac 2006). Stable dividends tend towards higher share prices because investors are more favourably disposed towards companies whose shares provide dividends they are certain of receiving than they are towards less reliable companies that are seen as more of a risk. The cause is that some shareholders rely on dividend income and are willing to pay a higher price for the less risky portion (Allen et al. 2007).

3.3.11 Financial management & project management performance indicators

Performance indicators have a vital part to play in assessing the success of a project and ensuring that it is meeting milestone commitments. KPIs may be financial, such as profit and revenue growth, but these are very backward looking. If a task fails to reach the desired growth, the project management may try harder in the future to find and succeed with new opportunities, but the income lost is gone. In fact, Qureshi, Warraich and Hijazi (2008) found that KPIs had the greatest impact on PMP and that Berg and Karlsen (2007) stated that KPIs that were predictive could help management to identify early where the project was not following project plan. This allows adaptation of the design at an early stage – whether a new strategy, tactics or team members – to secure the vision (Barcan 2010).

Financial management is the operational way in which a firm coordinates and moderates financial resources to exploit profitably and ensure liquidity. The three types of financial management decisions are *capital budgeting, capital construction,* and *working capital management.* It is critical that the decisions made in regards to financial management are concise, educated, and discerning (Belout & Gauvreau 2004).

Capital budgeting

Capital budgeting is the method of designing and managing the project's long-term investment. It involves the evaluating of the size, timing, and peril of future cash flows in the project, which is the sum of the capital budgeting process. The size, timing and peril of the future cash flows are the most significant things to consider with capital budgeting. Conventional methods that are used in

capital budgeting include a profitability index, value of future cash flows, and net present value. They can as well be used as a performance index (Barrow & Mirabella 2009).

The profitability index

The profitability index is the present value of an investment's future cash flows divided by its initial cost, likewise known as the benefit-cost ratio (Henricks 2010). The indicator assesses the value of each dollar invested in the society and a ratio is determined based on the present value of the benefits (PVB) to the present value of the costs (PVC) (Henricks 2010). The indicator is employed instead of *net present value*, which is the present value of benefits minus the present value of monetary values, when evaluating mutually exclusive proposals that hold different monetary values (Berg & Karlsen 2007).

The advantages of using the profitability index are that it tells whether an investment increases the firm's value; considers all cash flows of the project; considers the time value of money; considers the danger of future cash flows; is useful in ranking and selecting projects when capital is rationed (Berg & Karlsen 2007). The disadvantages of using the profitability index are that it requires an estimate of the monetary value of capital in order to estimate the profitability index and it may not make the correct decision when used to compare mutually exclusive tasks (Berg & Karlsen 2007).

Cash flow

The concept of cash flow can be defined in different ways. Cash flow is any kind of income or expenditure, which affects the cash accounts, acquired from the cash flow statements in an entire section of the financial statement (Barcan 2010). Management can manipulate accounting profits using creative accounting, but cash flow statements reflect a direct affirmation of the company's transactions on a cash basis. The cash flow statement tracks the movement of cash through the business over a period of time. The concept of cash flow can be generally split into two parts – cash inflow and cash outflow. The cash influx, known as inward cash flow or just cash flow, is generated as a termination of financing, ventures and sales.

To help interpret the monetary value of equity, management can use certain models (Allen et al. 2007). According to Allen et al. (2007), the dividend growth model is an approach that assumes dividends grow at a constant rate in perpetuity. The project value of the stock equates to next year's dividends divided by the difference between the needed rate of replication and the assumed

constant growth rate in dividends. It has been argued that there is actually just one principal advantage to use the dividend growth model for finding the cost of equity capital, which is simplicity, as it is both, easy to read and easy when in use (Belout & Gauvreau 2004).

The importance of selecting financial KPI's as an organisation to reflect growth and profitability can be extended to the individual project level. Using these techniques as a means to measure the financial viability, cost, profitability and performance of a project enables PM's to make critical fiscal decisions as the project progresses, by meeting budgetary constraints, as a means of measuring project performance and for reporting to stakeholders. However, as Belout and Gauvreau (2004) have stated the important aspect here is that these financial indicators must not only be practical, but easy to comprehend. In this research, the scope to which financial management practices are employed within project management will be considered. Specific questions (questions 26-31, and 33) were defined as a means to determine the breadth of those financial measures employed with regards financial calculations, financial contingency planning, financial estimation comparison, consideration of price escalations, acquisition of supplies, wages rate calculations, and budgetary performance. The findings from these questions when evaluated with the hypotheses (H7, H8, H9, and H11) will provide an increased understanding of the role that financial management practices have in project management, specifically as a function of KPI's and change management.

3.4 Summary

This chapter outlined the value of constructs and their role within project management. These constructs facilitate various processes that through successful implementation can aid in achieving project goals. Change management as a component of project management broadens the scope of project management in organisations, adding extra strength to an already effective tool used to increase service delivery and help to sustain or create a competitive advantage (Chartered Institute of Building 2011).

The inherent value brought by personnel in the project team is augmented by the specific targeting of KPIs to support corrective action planning throughout the project life cycle, without which the degree of risk for failure and financial implications are increased. These two aspects are as strategically critical to the overall likelihood of project success just as much as project leadership is. The interrelatedness of these three dimensions of project management, leadership, staffing, and financial constructs are integral to project success (Alshawi & Ingirige 2003; Kerzner 2013).

Chapter Four

METHODOLOGY AND METHODS

This chapter explains the research methodology and the methods employed to explore the hypothesis and research questions outlined in Chapter 1. Chapter 2 discussed the relevant literature and the contextual foundations for the research, while Chapter 3 proposed a conceptual model with variables and their possible relatedness using a quantifiable measurement tool – the project management performance assessment construction model. Chapter 4 introduces the research methodology and method, including, sampling, data collection and analysis techniques employed. The chapter also discusses the validity and ethics of undertaking this study.

4.1 Methodology

4.1.1 The methodological framework

Both descriptive and analytical research methodology was used to investigate the current state of PMP in Saudi Arabia (Leedy & Ormrod 2001). Descriptive research is defined as research that explores relationships between two or more variables; through the exploration of those variables, the research identifies the existence of any relationships between them (Williams 2007). The main goal of descriptive research is to describe the data and characteristics about whatever is being studied (Knupfer & McLellan 1996).

One of the most common approaches to descriptive research is to collect data using a survey (Creswell 2009). The collected data is analysed to find frequencies, averages, and other statistical calculations. Later studies or further inquiry might then be used to follow-up and determine the reasons for the observations. However, it must always be remembered that, although the variables being described may appear to have an association, causality cannot be assumed or proven.

The descriptive nature of the current research and the use of the survey instrument mean that the research can be construed to be 'positivist' as it is objective and independent of researcher bias (Creswell 2008; Sobh & Perry 2006). Positivist research focuses on gathering data and then transforming this into a numerical value. The data is then analysed using statistical software (IBM SPSS v.20) and conclusions were derived (Creswell 2009). During the current study, data was generated wholly independently of the researcher in response to carefully designed survey questions in order to reduce or eliminate bias. This and the large sample support the study as

'positivist' research (Creswell 2008). This objectivity and independence enable the reliability and validity of the findings to be generalised (Remenyi & Pather 2006).

Three alternative theoretical approaches were considered – 'constructivism', 'interpretivism' and 'critical theory' – but all were discarded. Constructivism was not a relevant option given the researcher's current lack of association to the field of study being researched, as well as that there were not any unstructured field interviews conducted (Sobh & Perry 2006). As for interpretivism, this research approach is associated with qualitative research and utilises unstructured interviews and observation of participants, neither of which was applicable in this research study (Livesey 2006). With regard to critical theory, similarly it was discarded due to a lack of personal observations being conducted (Sobh & Perry 2006).

Historically the evaluating the functionality of organisations has been undertaken with scientific methodology (Panther & Uys 2008). For example, Frederick Taylor's theory of management efficiency in evaluating units of productivity was through scientific methodology (Taylor 1911; Wrege 1991). The objective, scientific approach adopted by Taylor resulted in valid conclusions, thereby producing valuable information and knowledge, something that is considered characteristic of positivism (Roode 2003).

4.1.2 Purpose of the study

The aim of the current study was to investigate project management practices in the Kingdom of Saudi Arabia. An extensive review of the literature indicated that no previous studies have been undertaken involving a project management performance assessment model that incorporates change management and evaluated projects in Saudi Arabia. The goal of the study was to provide insight into project management performance in the kingdom, given the vast investment in new construction projects. Chapter 4 elucidates the research design, and describes the hypotheses and research questions. Data collection and analysis procedures are also justified.

Analysis of the data from the study provided significant informative data related to current and past project management practices. This information can be applied to future projects to improve project success and too insure project viability. In addition, this quantitative research study was undertaken to collect information about the impact of project change management on project management performance in Saudi Arabia, the first time that change management has been applied to PMP assessment.

Research had previously been conducted by Bryde (2003a) where a PMPA model was used to measure for the quality of project management practices. The PMPA is a measurement instrument and has been validated by a published empirical study (Qureshi, Warraich & Hijazi 2008; Mir & Pinnington 2014). The framework conforms to the European Foundation for Quality Management (EFQM) business excellence model, which provides a tried and tested framework, an accepted basis for evaluation and a means to facilitate comparisons both internally and externally (Hillman 1994).

In addition, Din, Abd-Hamid and Bryde (2011) investigated the effectiveness of financial management on PMP when they developed the PMPAC model. Furthermore, the Din, Abd-Hamid and Bryde (2011) studies acknowledged the research undertaken by Al-Kharashi and Skitmore (2009) that investigated what was causing delays in project completion in Saudi Arabia. The current research used the seven practices of the PMPAC model plus project change management as an area to explore in order to explicate its influence on sustainable PMP in Saudi Arabian organisations.

In conclusion, this research study examined PMP in Saudi Arabia in order to increase the understanding of PMP practices in Saudi Arabian organisations by exploring project challenges. Furthermore, it considered the types of development concepts being implemented and project management practices as compared to previous studies. The introduction of a PMP model was considered the most proficient way to explore these relationships. By using Saudi Arabia as a new study context, the model, it was anticipated, would help to expand the system boundaries of projects and project management by introducing new design and development elements.

4.1.3 Research questions

The research questions reflect specific PMP practices. They are focused on three distinct areas of project management: factors that influence projects; what role change management played in the design and development of the project; and what challenges project management faces in Saudi Arabia. The research questions were structured within the context of Din, Abd-Hamid and Bryde (2011) PMPAC model.

The research questions were:

- What is the typical role of project management criteria such as leadership, lifecycle process, staff, partnerships and resources, policy and strategy, financial processes, change management and key performance indicators in the various projects in Saudi Arabia?
- In particular, to what extent do change management practices influence PMP outcomes in Saudi Arabia?
- What are the challenges facing PMP practices in Saudi Arabia?

In considering the research questions, an exhaustive review of the literature was undertaken as to PMP practices and the effect certain key variables play on project outcomes. Given Saudi Arabia's extensive investment in and continued expansion of construction projects, project success is considered essential, given the real and potential financial, environmental and social impacts of projects. Understanding the impact of specific variables on shaping project success would help to reduce potential project challenges during the modernisation process. Insight into those variables that have greater impact on success would help to shape project planning and reduce risk of project failure. The variables are presented in Table 4.1.

Table 4.1 Items constituting the eight PMP variables

1.	**PROJECT MANAGEMENT LEADERSHIP (5 Items)**	
	L1	The project was a vehicle for tackling business-led change within the organisation.
	L2	Assistance was received in identifying the appropriate person to manage the project.
	L3	Features of a projects culture were developed.
	L4	The absence of one feature of a project culture will be covered by the existence of another feature.
	L5	The project environment hindered the development of a project culture.
2.	**PROJECT MANAGEMENT STAFF (2 Items)**	
	S1	There was a procedure to increase capability through development of team members.
	S2	There was a formal process for evaluating the Project Management staff.
3.	**PROJECT MANAGEMENT POLICY AND STRATEGY (3 Items)**	
	PS1	Awareness of Project Management was raised by selling the benefits of Project Management.
	PS2	Project Management was successful when it was developed as a formal practice.
	PS3	The implementation of Project Management policy and strategy involved major organisational change and obstacles to the change was recognised and overcome.
4.	**PROJECT MANAGEMENT PARTNERSHIPs AND RESOURCES (2 Items)**	
	PR1	There was an open two-way partnership with customers and suppliers during the project plan.
	PR2	The project stakeholders were formally involved in the project execution.

5.	**PROJECT MANAGEMENT LIFE CYCLE MANAGEMENT PROCESSES (4 Items)**	
	LP1	A model of critical business processes was used throughout the project life cycle.
	LP2	The role of life cycle models was recognised in developing features of a project culture.
	LP3	There was a written procedure covering all stages of the project life cycle, including pre and post implementation stages.
	LP4	Procedures were updated and benchmarked as response to changing requirements.
6.	**KEY PERFORMANCE INDICATORS (4 Items)**	
	KPI1	The method to manage the important KPIs was developed in the organisation.
	KPI2	There was a method to manage project objectives and link delivery of project benefits post implementation.
	KPI3	was a procedure for measuring stakeholder perceptions
	KPI4	The method against a wide range of KPIs to increase organisational capability, was developed
7.	**FINANCIAL MANAGEMENT PRACTICES (6 Items)**	
	F1	A financial calculation procedure was used.
	F2	There was a financial contingency plan, which was readily available.
	F3	The amount used to finance the project is based on the original estimated cost.
	F4	Inflation allowance and price escalation were considered in the cost estimation.
	F5	Early purchase of materials helped to reduce the cost of price escalation
	F6	Monthly historical costs were used to determine wage rates
8.	**PROJECT CHANGE MANAGEMENT (5 Items)**	
	CH1	The project is organised on a Work Breakdown Structure (WBS) format and with quantities assigned to each WBS for control purposes prior to total project budget authorisation.
	CH2	At project closeout, an evaluation is made of changes and their impact on the project cost and schedule performance for future use as 'lessons learned'.
	CH3	Project personnel take proactive measures to promptly settle, authorise and execute change orders on this project.
	CH4	Authorisation for change is mandatory before implementation.
	CH5	Areas susceptible to change are identified and evaluated for risk during review of the project.

The survey questionnaire with the quantitative questions can be found on page 297, appendix A.

4.1.4 Research hypotheses

In order to examine the possible associations between the variables, a hypothetical model was devised as illustrated with a path diagram in Figure 4.1. The model was constructed with 11 hypotheses as defined in Figure 4.2 (symbolised by H1, H2, H3, H4, H5, and H11), to be able to test these hypotheses with a view to evaluating those relationships and testing for the validity of this theoretical model.

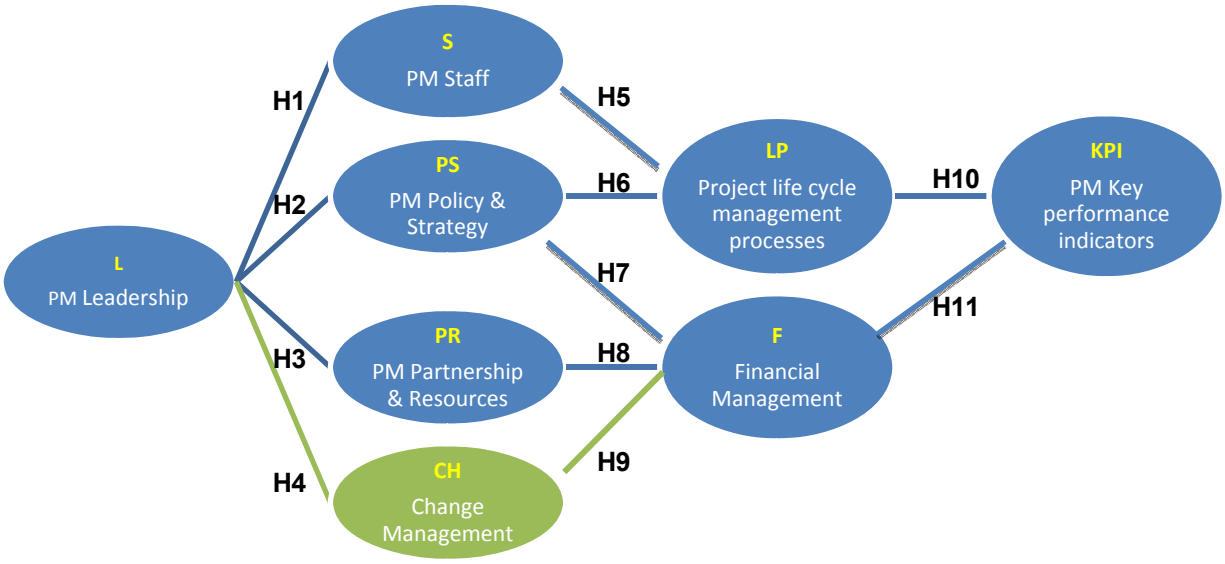


Figure 4.1 **Schematic diagram of hypothetical relationships between the eight project management variables**

The H1 hypothesis looks at the relationship between leadership and PM staff. This concept within the PMPAC model considers the planning of and resource utilisation of resources within a project from both the short-term perspective of the current project and future projects (Bryde 2003a).

H2 hypothesis similarly looks at both how leadership shapes and responds to policy and strategy within the project environment. In addition, it considers the affect leadership has on implementing policy and strategy.

H3 hypothesis considers the relationship between the project manager and stakeholders including vendors and suppliers, to the extent that partnering has been deemed essential in construction projects (Bryde 2003a).

H4 hypothesis is a construct that considers the role that leadership has in the decision making process in determining what change management to enact, how these changes are evaluated and implemented.

H5 hypothesis was determined based on an inference that leadership affected project performance (Rehman et al. 2012). Since leadership influences PM staff, which are highly correlated to PM performance (Qureshi, Warraich & Hijazi 2008) it was reasonable to assume that PM staff would affect the project lifecycle, as how this is managed ultimately affects project outcome.

H6 considers the hypothesis of policy and strategy affecting project life cycle and ultimately project success (Bryde 2003a; Mir & Pinnington 2014).

H7 hypothesis looks at policy and strategy and its influence on financial management practices as discussed by Kerzner and Saladis (2009) and Din, Abd-Hamid and Bryde (2011) as this has been deemed highly significant in improving project outcomes.

H8 hypothesis considers the interrelation of PM partnerships and resources and their cost burden on affecting project success from a financial management perspective. Vendor and supplier relations can impact heavily on the financial success of a project (Mir & Pinnington 2014); however this was contradictory to Din, Abd-Hamid and Bryde (2011).

H9 hypothesis was constructed to examine the impact the cost factor of enacting change management practices as noted by Cook (2004) and Motawa (2012), as to their influence on project success.

H10 hypothesis looks to assess project life cycle management and the KPI's employed to evaluate the performance during this time frame as a means for decision making and benchmarking, as this has been deemed highly significant by Qureshi, Warraich and Hijazi (2008) and Mir and Pinnington (2014). Having such information enables stakeholders and PM's n ability to enact change management practices within the project life cycle based upon this information.

H11 hypothesis looks to identify the role that KPI's have as assessment measures for the financial performance of a project. Without such measures financial management practices would not be as valuable (Din, Abd-Hamid & Bryde 2011), and by doing so these determinants can serve as a measure of the financial success of the project.

Path			
H5:	Staff	→	Life Cycle Management Processes
H1:	Leadership	→	Staff
H4:	Leadership	→	Change Management
H9:	Change Management	→	Financial Management Practices
H2:	Leadership	→	Policy and Strategy
H10:	Life Cycle Management Processes	→	Key Performance Indictors
H3:	Leadership	→	Partnerships and Resources
H11:	Financial Management Practices	→	Key Performance Indictors
H6:	Policy and Strategy	→	Life Cycle Management Processes
H7:	Policy and Strategy	→	Financial Management Practices
H8:	Partnerships and Resources	→	Financial Management Practices

Figure 4.2 **Hypothetical relationships between eight project management variables**

In Figure 4.3, the eight latent variables are represented by circular symbols. The 31 indicators are represented by rectangular symbols, identified using the code names from Table 4.1.

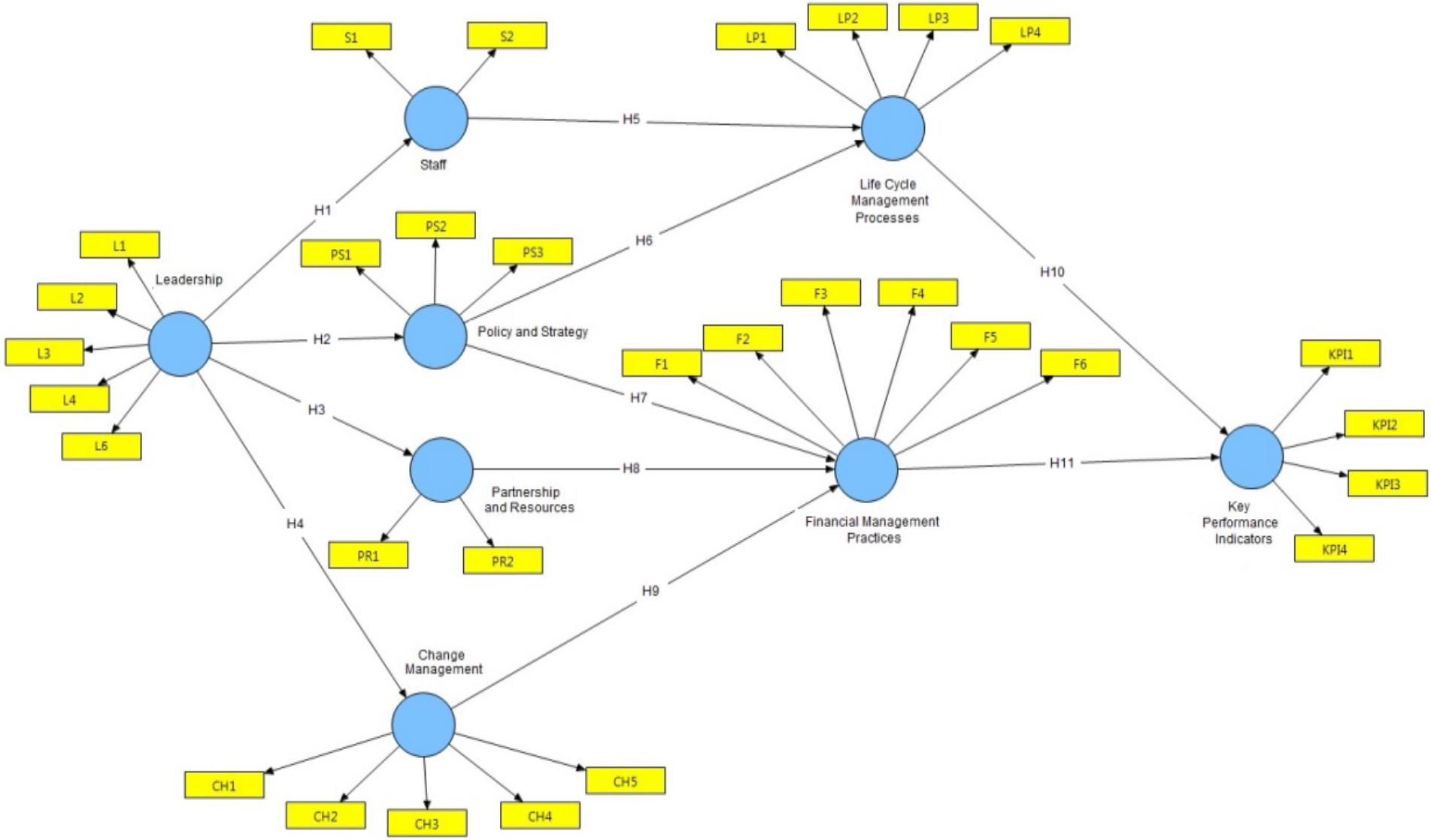


Figure 4.3 **Path diagram of 11 hypothetical relationships between eight project management variables and 31 indicators**

The cause and effect relationships between variables are shown by unidirectional arrows that illustrate the hypothetical assumptions represented by symbols. The arrows that point out from the latent variables show relationships with other clusters of indicators, which comprise the measurement model. When a latent variable was a frequent cause, it meant there was a reflective relationship. The effects of indicator variables were measured from correlating the item scores of the survey questionnaires.

The constructed structural model indicates that the H1 to H11 hypotheses were represented by arrows that pointed out from the latent variables to other latent variables. This denotes partial correlations and or weighted path coefficients between the hypotheses and forecasted effects. Despite the hypothesised cause and effects, there are specific limitations to the statistical analysis, in so much that PLS path modelling and correlation analysis do not provide sufficient evidence of causal relationships (Hair, Ringle & Sarstedt 2011). In order to determine the extent that dependencies exist between correlated variables greater evidence is required.

Figure 4.3 shows the 11 hypotheses that were tested using IBM *SPSS* v.20 statistical software. If the hypotheses contained the word 'significant' it denoted that there would be a statistical significance and that therefore any relationships that existed did so based on factual evidence and not the result of chance. Furthermore, there would also be practical significance and this would denote that if there were any relationships found between variables that they would be large enough such that the practical implication would be they could be of value in reality.

By using inferential statistics, statistical significance could be associated to a stipulated significance level. The level employed was 0.05, which implies that there is a $\leq 5\%$ probability for relationships to have been attributed to chance. Any practical significance was shown by variances of sizes and through proportional measurements taken. When variables were known to have a conjoint distribution or covariance, a 'significant positive correlation' was implied. This meant that any increase to a variable would change proportionately the other variable given positive correlation. Descriptive correlation design limitations suggest that correlations do not necessarily explain causation. Therefore, according to Huck (2009) and Pearl (2009) it is not conceivable for any variable relationship of cause and effect to be confirmed.

4.2 Methods

4.2.1 Study population

The Saudi Arabian Council of Engineers was contacted to access pertinent information about individuals who were the leaders of project-oriented organisations. The Council's assistance provided 3225 contacts at project driven organisations were aggregated to form a target population. The project leaders represented project management practitioners who were responsible for the implementation of projects within their organisations.

The researcher applied Roscoe's (1975) 'rule of thumb' of 10% as an appropriate sample size. Therefore, with a population of 3225, that would be 325 responses. This calculation would be endorsed by Gay and Diehl (1992) who state that for descriptive research a 10% sample is appropriate. Alreck and Settle (1995) suggest an upper limit of 1000 as a maximum sample size. The size of the maximum sampling error rate, and with a sample of 300, would be 5.8%, which is acceptable. At 400, 5% is the maximum threshold (Weisberg & Bowen 1977). It is reasonable to conclude that with a population of 3225, would yield a rate of 5% to 5.8% that would be acceptable - 5% was used. Given the target population was made up of project management professionals associated with the Saudi Arabian Council of Engineers and thus had specific expertise to answer the research questions being investigated, the target population was deemed suitable for sampling and consisted solely of that population that were solicited.

Sample size and method

Maxwell (1997) has suggested that purposive sampling is appropriate when specific people are intentionally chosen for their specialised knowledge. Purposive sampling was used as the targeted population was selected based upon expertise with characteristics suited to answer the research questions (Leedy & Ormrod 2005). By targeting specific cohorts relevant to the research topic, the quality of the research data can be assured (Leedy & Ormrod 2005). Creswell (2009) supported this concept of purposive sampling where participants are targeted based on their ability to add value.

With quantitative research, the sampling method is specified by statistical confidence levels (Davis 2005). One of the primary purposes of the research was to make generalisations about

project management performance, the larger the sample size, the greater the degree of validity according to Hair et al. (2010). Similarly, given simple regression analysis would be conducted, a sample >100 would yield greater confidence in the generalisations (Hair et al. 2010).

The formula below was used to calculate the minimum sample size. Confidence levels of 95% with +/- 10% confidence intervals were assumed.

$$\boldsymbol{n = \frac{(1.96)^2\, X\, (.25)\, X\, (Population)}{(1.96)^2\, X\, (.25)\, +\, (Population\, -\, 1)\, X\, (10\%)^2}}$$

Let n represent the number of participants (.25) equal
the normal error of distribution and the confidence level is 10% (Gilliland & Melfi 2010).
n = 100.011 rounded to 100 respondents is determined as the sample maximum.
The formula was applied to the existing population from which the sample size was determined.

$$\boldsymbol{n = \frac{(1.96)^2\, X\, (.25)\, X\, (3225)}{(1.96)^2\, X\, (.25)\, +\, (3225\, -\, 1)\, X\, (10\%)^2}}$$

$$\mathbf{n = 93\ repondents\ at\ a\ minimum}$$

Emails to the selected sample cohort yielded 419 completed responses with a margin of error rate of 92% and the confidence interval was 2.68% from the completed surveys. Given the sample size and the lower margin of error, there was high degree of confidence in the sample. From these responses, generalisations of Saudi Arabian project management practices could be made.

4.2.2 Online questionnaire

A questionnaire that incorporated structured questions (Appendix B) was used to collect data. According to Creswell (2009), this approach enables expeditious data collection and analysis. By utilising a survey questionnaire, the researcher could employ a deductive approach to survey analysis (Saunders, Lewis & Thornhill 2007). The closed-ended questions used in the survey sought to answer the research questions and elicit specific information from the sample that would allow generalisations to be made (Creswell 2009). Using closed-ended questions facilitated simplicity in statistical analysis and using a Likert scale increased the ease with which participants could respond and simplified analysis (Neuman 2000). The use of the scale also provided reliability and eliminated bias.

The use of an online survey provided an expedient method to conduct a broad based inquiry and reduced the amount of time involved in the physical design and production of the survey (Creswell 2012). An online survey provided an efficient means of accessing the widely dispersed target population. Access to the potential respondents was critical since participants had to have the experience to answer the research questions (Creswell 2012). The targeted cohort was specific to project management and represented a set of common characteristics. It should be noted that this was a cross sectional and not a longitudinal study, and the type of cohort differs between one-off surveys and those conducted over time (Creswell 2012).

Given the size of the cohort population and the fact that potential participants were dispersed geographically across the Kingdom of Saudi Arabia, the use of an online survey reduced the inherent costs associated with mailing surveys, as well as saving time processing (Bachmann & Elfrink 1996; Garton, Haythornthwaite & Wellman 2003; Taylor 2000; Yun & Trumbo 2000). Furthermore, response rates for online surveys have been shown to be the same as or better than traditional surveys (Thompson et al. 2003; Wright 2005). Web based surveys are highly efficient from a distribution perspective and provide a confidential way to access the targeted respondent (Andrews, Nonnecke & Preece 2003). Furthermore, because the internet interfaces readily with desktop technology, transfer of data to computer-based data analysis software is easily accomplished. This results in a reduction of transcription errors and eliminates any opportunity for survey responses being altered (Andrews, Nonnecke & Preece 2003).

The pilot study

A pilot study provided the researcher with invaluable information, enabling changes to the research model and improving the development of the survey instrument. The survey questions were devised by the researcher to ascertain general information using a structure from Din, Abd-Hamid and Bryde (2011), which focused on how PMP was practised. Closed questions from Zou and Lee (2008) were also consulted, and all questions were related to change management.

Following the pilot study, input from university academics and from the project practitioners who participated in the pilot study resulted in the clarification of any ambiguous questions, other modifications and a few deletions of questions. The revisions provided a final instrument that

could be published using the web based survey application *SurveyGizmo* so that the target population could be notified by email of the opportunity to participate in the research study.

By undertaking a pilot survey and revising the survey questionnaire, the risk of questions not being answered, which would have skewed the data, was reduced. The greater the likelihood of increased participation, along with response rate, the greater the possibility of increasing the validity of any generalisations made from the study (Fowler 1998; Babbie 1990).

Survey design

Important considerations in conducting a web-based survey are the ease of access of the questionnaire for the participants, which can alleviate geographic challenges of traditional surveys and afford the respondent a level of convenience to complete it anonymously (Cook, Heath & Thompson 2000). The survey questionnaire was devised from several models and adapted to address the research questions about project management performance practices.

Likert scales were incorporated into the questionnaire, whereby the interval scales were a means to quantify and measure the value assigned to each question. A Likert scale must consist of four or more intervals and for this study; five intervals were used (Clason & Dormody 1994). Likert scales represent a 'greater than' association. They are analysed by aggregating the sum each question receives when all the participants' scores for an answer are added together. The data also allowed the mean response to each question to be calculated (Boone & Boone 2012). Dawes 2008 found that whether using a 5-point or 7-point Likert scale that the resultant data was comparable, thus, it follows that there should be little affect in using a 6-point Likert scale.

The questionnaire was structured in four parts. The first section obtained descriptive data about respondents and their organisations. The second section explored types of projects in Saudi Arabia. The third section obtained the demographic characteristics of the respondents. The next section asked the respondent to focus on a recently completed project and data were elicited about the project management practices, financial management practices, project change management and project success of the recently completed project. The PMP assessment model was used to measure project management practices (Bryde 2003a). The PMPA is an extensively adopted

measurement instrument and has been validated by a recently published empirical study (Qureshi, Warraich & Hijazi 2008). The framework conforms to the European Foundation for Quality Management Business Excellence Model, which provides a tried and tested framework, an accepted basis for evaluation and a means to facilitate comparisons both internally and externally (Hillman 1994).

In the PMPAC, project management activities are divided into eight broad areas:

- project management leadership
- project management staff
- project management policy
- project management strategy
- project management partnerships and resources
- project management finance
- project life cycle management process
- project change management.

These enablers reflect the activities that need to be undertaken to deliver high levels of PMP. The final area in PMPA is project management key performance indicators, which focuses on the practices by which actual achievement is measured.

A 41-question survey (Appendix B) corresponds to the items in the PMP Assessment Construction model from Din, Abd-Hamid and Bryde (2011). The other five questions were related to project change management practices and were adapted from prior research (Zou & Lee 2008). The 41 items were scored on a scale from 1 to 5 using a five-point closed-ended response format, with intervals of Strongly Disagree; Disagree; Neutral; Agree; Strongly Agree, or Not Applicable (see Appendix B).

The questions were randomly scattered throughout the data matrix, and were not systematically related to any specific respondents, groups of respondents, or items. The decision was made to replace the Not Applicable responses by a score of 3, Neutral. This replacement was logical because it was assumed that if a respondent thought that the item was not applicable, then they

would also have a neutral opinion about the item. The replacement of Not Applicable by Neutral resulted in the frequency of the Neutral responses increasing from a total of 2498 (19.2%) before replacement to a total of 2892 (22.2%) after replacement (see Appendix A). Additional factual yes and no questions were included.

Researchers use a quantitative approach as it is grounded in numerical analysis (Williams 2007), and by combining this with a web-based survey, gathering the initial data was simplified. The length of time involved to complete the survey was estimated at 15 minutes. The ease of use of *SurveyGizmo* benefitted the research greatly. Not only could the questionnaire be set up using the *SurveyGizmo* software, but also data could be transferred into Microsoft *Excel*, where it could be manipulated and analysed. In the email correspondence, a cover letter was sent that explained the research rationale (Appendix C) and provided requisite information to access the survey and provided a security code, and companies were asked to forward the survey to their project managers (Appendix D).

Web-based designed surveys are shown to provide cost savings when conducting research (Cook, Heath & Thompson 2000). In undertaking this approach, both time and cost savings were realised. *SurveyGizmo* was selected from among 20 choices of web-based survey software as it met the research needs since it met all the prescribed parameters of ease of use, low cost point, and ease of transfer of data.

Research sample response

The research questionnaire generated 419 responses over the three months the survey was available online (Figure 4.4). From the data, two population cohorts emerged. The preponderance of the survey population (337 of the 419) at 80.4% (N= 337/419 = 80.4%) were project leaders in Saudi organisations based in Saudi Arabia. The second cohort consisted of 82 respondents, which represented 19.6% of the respondents (N = 82/419 = 19.6%). These were made up of project leaders from international organisations with the company headquarters located overseas.

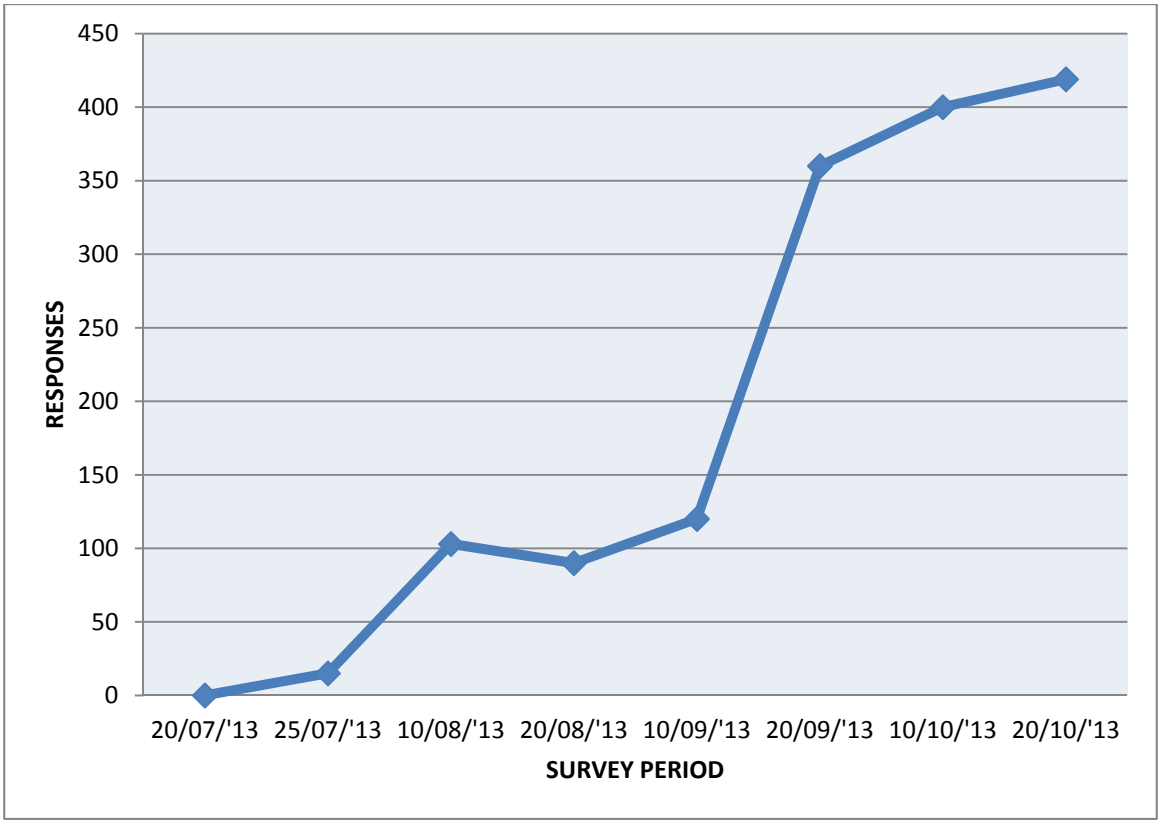


Figure 4.4 Distribution of responses during the survey period

The data collection produced information that could be used for comparative analysis, including demographic frequencies and respondents' characteristics and was cross-tabulated with the two cohorts of respondents.

Most of the Saudi respondents were resident in the central region of Saudi Arabia (N = 252 = 60.1%). The second highest place of residence was the western region of Saudi Arabia with 200 hundred project managers, accounting for 47.7% of the total. The predominant types of projects were commercial, industrial and residential.

4.3 Data analysis

Analysis of the responses to the survey questionnaire were statistically analysed to explore the relationships between four demographical variables (detailed in Chapter 5) – the citizenship of the respondents, Saudi or non-Saudi organisations, regions where the projects were located, and types of projects – and the eight PMP variables (*leadership, staff, policy and strategy, partnerships and resources*).

The response data were analysed in four phases: (a) screening and cleaning of survey data; (b) demographic and contextual characteristics of the respondents; (c) descriptive analysis of PMP variables; and (d) structural equation modelling.

4.3.1 Descriptive analysis

The initial phase of data analysis was conducted using *SurveyGizmo* and was then transferred to Microsoft *Excel* in the form of an extract file containing the collected data. Both descriptive and demographic data were analysed using IBM *SPSS* v.20. *SurveyGizmo* has inbuilt real-time charts, graphs and analysis tools so that it can create, through the use of cross tabs and filtering, opportunities for data manipulation. Transferring the data to *Excel* then into *SPSS* increased data handling, which provided an opportunity to transform variables and correct missing values. By transferring data into *Smart-PLS i*n the form of a CSV file, hypotheses and the model variables could be tested.

The descriptive analysis included presenting the cumulative data in histogram charts that illustrated the frequency distribution along with standard deviation and means analysis. The use of *SPSS* enabled the researcher to compute the statistical averages for each variable as selected by the respondents. In using Pearson's r coefficients, the construction of a correlation matrix showed the relationships amongst the variables. In following Cohen et al. (2003), the Spearman's correlation was not conducted, given the irrelevance of the normality assumption due to the sample size exceeding 100 respondents.

4.3.2 Structural equation modelling analysis (SEM)

Structural equation modelling (SEM) is a powerful array of statistical techniques that can be used to explore the relative strengths of the relationships between multiple variables, incorporating and integrating path analysis with factor analysis (Kline 2010; Hoyle 2014). The latent variables (i.e., the concepts or constructs that are not directly measured by the researcher) are operationalised by compositing the indicator variables (i.e., the data measured by the researcher).

The relationship between the indicator variables and the latent variables is known as the 'measurement model' (Nesselroade & Cattell 2013). Each latent variable is assumed to

correspond to a single, reliably measured factor, consisting of a linear combination of indicator variables, computed by factor analysis. The relationships between the latent variables (known as the structural model) are explored by path analysis (Hair et al. 2010).

AMOS-SEM

Two SEM approaches are currently popular. The first is to construct an explanatory model, using software such as *AMOS* to validate the measurement model and to confirm the goodness of fit of the structural model by extracting information from the covariance-variance matrix (Henseler, Ringle & Sinkovics 2009). The second is to construct a predictive model using partial least squares path analysis (PLS) software, such as *Smart-PLS*, which does not extract information from the covariance-matrix, and is therefore a completely different approach (Hair et al. 2010).

The survey data collected was used to construct a structural equation model for this study using ***AMOS***; however, a stable solution did not result and conveyed an error message that stated 'Model/Group Fit: This solution is not admissible'. According to Bowker and Randerson (2007), this is a common occurrence. A central aspect of *AMOS* is the use of maximum probability estimation (Arbuckle 2013), which with the comparison of variances and covariance's, these can pose methodological issues. Potential reasons that can be surmised for *AMOS*'s failure are:

- the SEM model was unable to adapt to the data
- erroneous modelling was specified
- the sample size was not large enough
- how the data characteristics were distributed and measured was not suitable.

Typically, *AMOS* will assume that interval levels of the indicators will be normally distributed when measured and have continuous scales. In this study, the indicators were ordinal integers and had a restricted range (1 to 5) when measured. *AMOS*'s functional approach is to measure for 'goodness of fit' thereby adopting a confirming approach when testing the data to a defined model that has been constructed with both reliability and convergent validity.

When a study is predominantly exploratory, *AMOS* is considered inappropriate as a choice of analytical tool because the empirical knowledge is limited and the level of comprehension of the

model structure that is to be tested is similarly constrained (Kline 2010). This study was an exploratory study, not confirmatory, and the model's properties were not clearly delineated prior to the study commencing. When a model is not fully conceptualised prior to the commencement of a study, *AMOS* should not be used (Bowker & Randerson 2007). Given the research methodological issues of this study, *AMOS* was not employed as a means to construct a structural equation model.

SmartPLS-SEM

Given the constraints of *AMOS,* PLS path modelling was applied using the *Smart-PLS* application, which applies an entirely dissimilar algorithm to calculate the association between variables (Temme, Kreis, & Hildebrand 2006; Haenlin & Kaplan 2004). PLS path modelling has the distinct advantages to a researcher, given the lack of strict requirements for sample size and data characteristic distribution and measurements; as such, it has been referred to as a 'soft' technique (Hair, Ringle & Sarstedt 2011).

The justification for the use of *Smart-PLS* for this research study is that the research by Anderson and Swaminathan (2011) and Henseler, Ringle and Sinkovics (2009). Furthermore, Wetzels, Odekeren-Shroder and van Oppen (2009) noted the benefits for this in the construction of hierarchical models, and measuring the relationships amongst variables in organisational management.

Using *Smart-PLS*'s GUI (graphic user interface) the path diagram was constructed founded on the model shown in Figure 4.1 and is illustrated in Figure 4.3, as we have already seen. In the diagram the eight latent variables are shown by circular symbols, with the 31 indicators shown as rectangular symbols and are recognised by the associated codes in Table 4.1. The cause and effect relationships between symbols are shown with unidirectional arrows. Arrows pointing outward from latent variables that point toward clusters of indicators shows reflective relationships within the construct model.

When reflective relationships were identified, the common cause was the latent variable and the inter-correlated effects were mirrored by the indicator variables that were measured from the

multiple survey questionnaire item scores. The hypotheses labelled H1 to H11 was shown by arrows pointing between the latent variables within the structural model. This illustrated the partial correlations or weighted path coefficients of the hypothetical causes and the predicted effects. Hair, Ringle and Sarstedt (2011) stated that PLS path modelling and correlation analysis is limited despite the causes and effects being hypothesised, in so much that it is impossible to assert causal relationships using statistical analysis by itself. It is necessary to identify further factual evidence regarding the dependencies between the variables.

4.3.3 Testing the quality of the measurement model

There is a need to affirm the fundamental suppositions through testing for internal consistency reliability and convergent validity each of the latent variables, to confirm the PLS path model. In order for indicators to have latent variables they must have a significant proportion of a common variance, by this they will then have convergent validity. When indicators are aggregated, and the resulting measurement yields a unified construct that points to one logical direction, the result is internal consistency reliability. To affirm internal consistency reliability and convergent validity in PLS path modelling specific criterion are typically used. Those criteria are:

a) The coefficients for the majority of the factors should be at least ≥ 0.5.
b) Variances should be elucidated by the indicators for every factor and should have a minimum average of 50%.
c) For internal consistency reliability, the use of Cronbach's alpha coefficient for the indicators for each factor must preferably be ≥ 0.6 (Wetzels, Odekeren-Shroder & van Oppen 2009).

Validation of the measurement model

The first stage of the analysis was to validate the measurement model (i.e., the relationships between the latent variables and the indicators). The quality criteria to establish valid latent variables for PLS path analysis as recommended by Chin (1998) were applied as follows:

a) The loading coefficients computed for all of the items in each factor must be strong (≥ +.7).
b) Collectively, the factors must explain at least 50% of the variance in the data.
c) The internal consistency reliability (Cronbach's alpha coefficient) for each factor must be ≥ .7.

These criteria ensured that a linear combination of items contributed to each latent variable, and that the items consistently measured a unifying construct in one logical direction. *Smart-PLS* does not include any goodness of fit statistics, because all of the variance is considered useful, and no information is extracted from the variance/covariance matrix (Hair et al. 2010, Hair, Ringle & Sarstedt 2011).

Evaluation of the structural model

There was a need to evaluate the structural model for the β coefficients as well as the R2 values. In Figure 5.2 (Chapter 5), the β coefficients are signified by single-headed arrows that are illustrated between the pairs of latent variables (these are deemed equivalent to weighted partial regression coefficients as found in a multiple linear regression model). Since the β coefficients signified a standardised value, the range was −1 to +1. The function of β coefficients provided a comparative of the directions and the relative strength of the correlations between latent variables both positively and negatively. The analysis performed indicates the exclusion or partialled out correlations of additional latent variables.

R2 values were assessed by measuring the percentage of variance of the latent variable and this was elucidated by the amount of variance of the latent variables that flowed inward. When an R2 value is at a minimum of 25%, this is deemed to signify a significant effect (Wetzels, Odekeren-Shroder & van Oppen 2009). Bootstrapping was employed to determine the statistical significance for every β coefficient. *Smart-PLS* conducts this process automatically and computes this by selecting random samples (100 in total) repetitively from the data using 30 case samples each time. From which, the standard error and mean for every β coefficient was computed. To determine that the β coefficient's mean value was considerably different from zero when compared to the conventional $\alpha = 0$ .05 level for testing for statistical significance, the *Smart-PLS* software application automatically by employs two-tailed t statistics.

4.3.4 Demographic and contextual characteristics of the respondents

SPSS provided frequency distributions for the responses to the first five items from the survey questionnaire by automatically computing them using the *Descriptive Statistics – Frequencies* function. The responses were summarised and charted (Figure 4.5) to show where the respondents were located in Saudi Arabia:

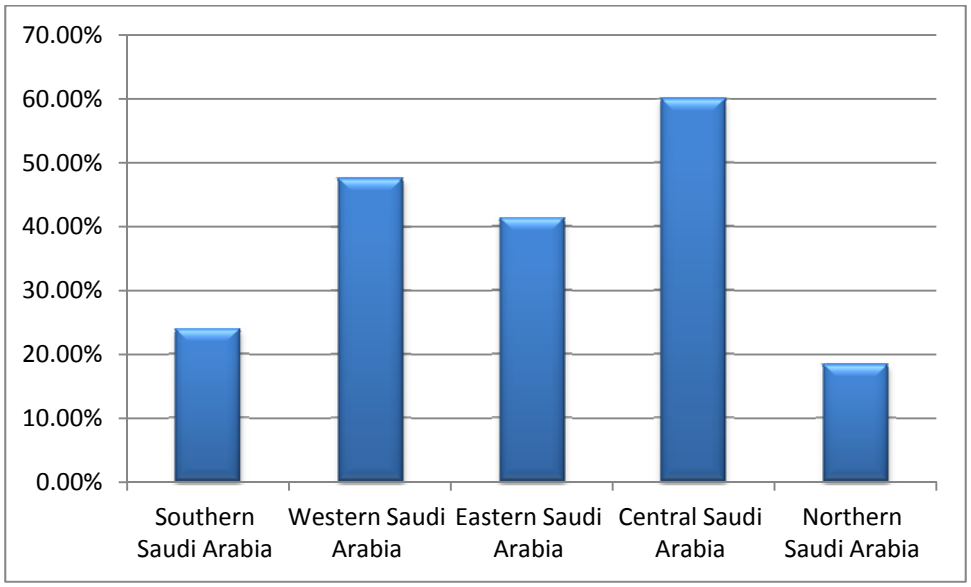


Figure 4.5 Distribution of responses according to Saudi Arabian regions

The *SPSS* technique *Descriptive Statistics – Cross-tabs* was used to conduct a Pearson's Chi-square test (represented by $\chi 2$) to determine the level of association between the respondents of both Saudi and international organisations and their citizenship, along with regions in which projects were located and the various sectors in which the projects were undertaken.

Statistical significance was determined to be when $\alpha = .05$ level and when $p < .05$ for the $\chi 2$ statistic. There was no statistical significance exhibited for the respondents, whether they worked for a Saudi or international organisation when correlated with the regions in which the projects were undertaken ($\chi 2, 4 = 0.313, p = .987$), or correlated with the sector the project in which the project was completed ($\chi 2, 5 = 10.04, p = .074$).

Validity

Determining validity and reliability in quantitative research that encompasses the use of survey questionnaires that gather data from a sampled population in order that generalisations about that data can be extruded and compared is considered valid, if the constructs of the research questions and hypotheses are deemed relevant to the data, which has been gathered (Wainer & Braun 1998). With reliability, Joppe (2000) and Gast and Ledford (2014) have suggested that validity is dependent upon consistency and the ability to repeat the study given the same methodology. Furthermore, defining validity is seen as the substantiation of the results from the data collected, which infers the method by which the information was gathered can be duplicated. Validity is the justification of the generalisations that are drawn from the research data collected (Moskal, Leydens & Pavelich 2002).

This research was conducted using a constructed model to investigate the research questions and hypotheses, thereby its role in determining the relationship between the constructs and the informational data extrapolated must similarly be validated through testing (Wainer & Braun 1998). This research study's validity could be further justified through statistical analysis software that has a proven capability, and both *Smart-PLS*-SEM and IBM *SPSS* v20 have been shown to increase validity through reliable analysis techniques (Cabrera-Nguyen 2010). Given that, the objective of positivist and postpositive quantitative research involves associating numerical values in order to conduct statistical analysis to make determinations (Creswell 2009). It follows that the use of such software will increase the validity of those findings and the conclusions derived from them.

4.4 Ethical considerations

The privacy and confidentiality of those respondents and organisations who participated in this research study were upheld and measures taken to protect information, given the use of a web-based approach to the research (Cooper & Schindler 2006). Consent to conduct the research was given by the University of Adelaide's Office of Research Ethics, Compliance and Integrity to safeguard the research in a way meeting with National Health and Medical Research Council (NHMRC) standards (2007).

In order to conduct this research, a proposal was submitted, reviewed and approved and the participants were given an informed consent letter (Creswell 2009). This letter explained the rights of the participants and advised that their information would be protected (Appendix E). Furthermore, all participants were informed as to the purpose of this study and that it was part of the research for a PhD.

The informed consent letters were distributed by email, explaining that participation was voluntary and that respondents could access the survey through a web link.

No request was made to access personal information, reducing any potential risk to participants' privacy. The use of a web-based survey (*SurveyGizmo*) meant any data collected would be stored in a secure database as prescribed by law. The raw information gathered was kept in a secured locked storage device and solely accessed by the researcher. At the end of the study, the research information was aggregated and the findings do not include any individual or organisational information in those results. The researcher's primary concern was to ensure the ethical integrity and privacy of the participants' information was both secure and restricted from any other party. All information collected by *SurveyGizmo* was downloaded on to a USB and securely locked away with the files.

4.5 Limitations of the research and areas for future study

The sample response rate being only 12.9% could be considered a limitation as noted per Creswell (2008). However, the researcher felt this rate was justifiable and that it did not have any bias and provided a realistic representation of the target population. The sampling frame used Saudi governmental authorities' email lists to initiate contact and follow-up. According to Wright (2005), email lists can be a potential limitation when used as they have can be repetitive and this can affect sample response rates.

Despite the use of *Smart-PLS* path modelling and descriptive correlation analysis, there was the possibility of unsubstantiated causal relationships in accordance with Hair, Ringle and Sarstedt (2011) and Huck (2009) and Pearl (2009). The researcher's selection of topic, questions and explanation of the research findings could be construed to be less objective, as these decisions are naturally subjective.

Furthermore, the descriptive statistics (in next chapter) show that the significance of research differences could be explored in future research. Second, the survey results were derived from companies representing the organisations working in Saudi Arabia and generalisations beyond this population cannot be made. Future research could collect data from other geographical regions, e.g. US, Europe the Far East, Australasia and South America to see if the findings are replicated and to explore the influence of national culture on any variations in performance (which was outside the scope of this study).

Furthermore, to test the external validity of the project management practices, additional studies would be needed with increased sample sizes and geographies. Third, the findings are based on the use of adapted survey data, where respondents were asked to recall the practices and outcomes of their most recent completed project. To assess whether the data was affected by response bias, future research could collect data from other project stakeholders, such as clients or end-users.

4.6 Summary

This research study used a descriptive correlational research design to investigate PMP practices across Saudi Arabian organisations by targeting project leaders and managers. The research study sampled 419 participants after completing a pilot study. The responses to the survey questionnaire were statistically analysed to explore the relationships between four demographic and contextual variables: citizenship of respondents, Saudi or non-Saudi organisations, regions where projects were located, and types of projects. In addition, analysis was conducted between the eight PMP variables (*leadership, staff, policy and strategy, partnerships and resources, life cycle management processes, key performance indicators, financial management practices,* and *change management*). The research was conducted within the prescribed framework of the NHMRC and limitations such as the sample response rate were justified. Additional research limitations were outlined, particularly with the use of *Smart-PLS* path modelling and descriptive analysis.

Chapter Five

ANALYSIS AND RESULTS

This chapter explains how the novel PMPAC plus change management model was tested, along with the research hypotheses that were outlined in Chapters 2 and 3. This was undertaken using the methods outlined in Chapter 4. Furthermore, the chapter discusses the complete statistical analysis conducted using *SPSS* and *Smart-PLS* of the sample responses to identify descriptive characteristics and analytical findings of those variables within the theoretical construct in terms of their effect on project management performance.

5.1 Analysis

The response data were analysed in four phases as follows: (a) screening and cleaning of survey data; (b) demographic and contextual characteristics of the respondents; (c) descriptive analysis of project management performance variables; and (d) structural equation modelling.

5.1.1 Screening and cleaning of survey data

All responses to the 31 items in the online questionnaire were coded in the data editor of IBM *SPSS* version 20.0 with the participants in the rows and the response data in the columns. The frequency distributions of the responses were tabulated and checked for erroneous and missing values. Following an analysis of the patterns of the distribution of the missing values, a decision was made as to how they should be replaced.

5.1.2 Demographic and contextual characteristics of the respondents

The frequency distributions of the responses to the first five items in the online questionnaire were computed using the *Descriptive Statistics – Frequencies* procedure in *SPSS*. A table was constructed to summarise the responses (Table 5.1).

Table 5.1 Summary of responses

Item 1	**By completing this survey, you are consenting to be part of this research study.**		
Item 2	Your citizenship is	1 = Saudi	2 = Not Saudi.
Item 3	Your organisation is	1 = Saudi Arabian	2 = International.
Item 4	Type of projects =	Industrial, residential, commercial, highway construction, heavy construction, and/or telecommunications.	
Item 5	Most projects are located in	Southern, Western, Eastern, Central, and/or Northern regions of Saudi Arabia.	

Pearson's Chi-square tests using the *Descriptive Statistics - Cross-tabs* procedure in *SPSS* were conducted to determine whether the respondents worked for a Saudi or an international organisation. This was done to determine whether they were significantly associated with their citizenship, the regions where most of their projects were located, and with the different types of project. Statistical significant was declared when the $\alpha = .05$ level if $p < .05$ for the χ^2 statistic.

5.1.3 Descriptive analysis of PMP variables

A total of 26 items was scored on a scale from 1 to 5 using a Likert six point closed-ended response forma, with anchors of *Strongly Disagree; Disagree; Neutral; Agree; Strongly Agree*, or *Not Applicable* (see Appendix A). Eight PMP variables (*leadership, staff, policy and strategy, partnerships and resources, life cycle management processes, key performance indicators, financial management practices,* and *change management*) were operationalised by averaging the item scores that constituted each variable.

A descriptive analysis of the project management variables was conducted. The analysis included:

- checking the variables for normality using frequency distribution histograms
- comparing the mean scores ± 95% confidence intervals (CI) for each variable
- identifying the bivariate correlations between the variables.

A correlation was declared significant at the $\alpha = .05$ level if $p < .05$ for the Pearson's *r* statistic (see again Table 4.1).

5.1.4 Structural equation modelling

Structural equation modelling (SEM) is a powerful array of statistical techniques that can be used to explore the relative strengths of the relationships between multiple variables, incorporating and integrating path analysis with factor analysis (Kline 2010). The latent variables (i.e., the concepts or constructs that are not directly measured by the researcher) are operationalised by compositing the indicator variables (i.e., the data measured by the researcher).

The relationship between the indicator variables and the latent variables is known as the 'measurement model'. Each latent variable is assumed to correspond to a single, reliably measured factor, consisting of a linear combination of indicator variables, computed by factor analysis. The relationships between the latent variables (known as the structural model) are explored by path analysis.

The relationships between the latent variables (known as the structural model) were explored by path analysis. Two SEM approaches are currently popular:

1 Constructing an explanatory model, using software such as AMOS, to validate the measurement model and to confirm the goodness of fit of the structural model by extracting information from the covariance-variance matrix; and

2 Constructing a predictive model using partial least squares path analysis (PLS), using software such as Smart-PLS, whereby this does not extract information from the covariance-matrix, and is therefore a completely different approach (Hair et al. 2010). The main differences between the features of AMOS-SEM and Smart-PLS-SEM are listed in Table 5.2; and were adapted from Bowker and Randerson (2007).

Table 5.2 Comparison of *AMOS* and *Smart-PLS* SEM

***AMOS*-SEM**	***Smart-PLS*-SEM**
The focus is on the strength of conformity of the model with the data to explain the relationships between the variables.	The focus is on predicting the relationships, and not explaining the relationships between the variables.
Assumes a multivariate normal distribution of variables measured at the scale/interval level. Even small departures from multivariate normality can compromise the statistical inferences.	No restrictions on the measurement or distributional characteristics of the variables.
Extracts information from the covariance-variance matrix. Comparing variances and co-variances is central to SEM.	Does not extract information from the covariance-variance matrix.
Maximum likelihood estimation (MLE) is commonly used to fit the data to the model. MLE is based on maximising the probability that the observed co-variances are drawn from a population assumed to be the same as that reflected in the coefficient estimates.	Does not use MLE to fit the data to the model.
The process centres around two steps: validating the 'measurement model' and fitting the 'structural model'.	The process does not centre on validating the 'measurement model' and fitting the 'structural model'.
Assumes that the variance in the structural model can be partitioned into the explained variance and the unexplained variance (residual error).	Assumes that all the variance is useful, and can be explained. There is no concern for residual error.
The data must fit a predefined model, indicated by goodness of fit statistics. Goodness of fit-tests determines if the model being tested should be accepted or rejected.	No predefined model is assumed, and no goodness of fit statistics is used to determine if the model should be accepted or rejected.
Acceptable goodness of fit measures is used to indicate convergent validity.	No goodness of fit measures is used to indicate convergent validity.
Discriminant validity is indicated by modification index coefficients.	No modification index coefficients are computed to indicate discriminant validity.
Requires a large sample size (at least 10 to 20 cases for each measurement).	Does not require a large sample size (no minimum number of cases for each measurement).

An attempt to construct a structural equation model with the survey data collected in this study using *AMOS* failed to converge on a stable solution. The only output was the error message 'Model/Group Fit: This solution is not admissible'. This is a common experience using *AMOS* (Bowker & Randerson 2007). Methodological issues arise when comparing variances and co-variances and when using maximum likelihood estimation, which are central to *AMOS*.

The failure of *AMOS* could possibly be because:

- the model did not conform to the data
- the model was incorrectly specified
- the sample size was too small
- the distributional and measurement characteristics of the data were inappropriate.

AMOS assumes normally distributed interval level indicators measured with continuous scales, but the indicators used in this study were ordinal integers measured across a very restricted range (1 to 5). Furthermore, *AMOS* is generally viewed as a confirmatory approach. To test the goodness of fit of data to a well-defined model with previously established convergent validity and reliability; however, it is premature and inappropriate to use *AMOS* if the approach is mainly exploratory, when there is limited empirical knowledge and understanding of the structure of the model being tested (Kline 2010).

In this study, the approach was mainly exploratory and not confirmatory. A conceptual model was conceived, but its properties were not possible to specify before the start of the study. Bowker and Randerson (2007) advised that *AMOS* should not be used if the model has not been conceptualised in detail before the start of the research. Because of methodological problems, *AMOS* was not used to construct a structural equation model in this study. PLS path-modelling using *Smart-PLS* was applied as the alternative. *Smart-PLS* uses a completely different algorithm to predict the strengths of the relationships between the variables (Haenlin & Kaplan 2004; Temme, Kreis & Hildebrand 2006).

PLS path modelling has been called a 'soft' technique and a 'silver bullet' because it operates with no strict requirements about the sample size, or the measurement and distributional characteristics of the data, and it makes minimal demands on the researcher (Hair, Ringle & Sarstedt 2011). The use of *Smart-PLS* was also justified in this study because this software has previously been used in business research (Anderson & Swaminathan 2011). Based on the analysis of the questionnaire data using 5-point Likert scales PLS path modelling is particularly useful for constructing hierarchical models of the relationships between variables involved in organisational management (Wetzels, Odekeren-Shroder & van Oppen 2009).

5.2 Testing the quality of the measurement model

The underlying assumptions of convergent validity and internal consistency reliability must be tested for each latent variable in order to ensure that the PLS path model is meaningful. Convergent validity means that the indicators, which constitute a latent variable, must share a high proportion of common variance. Internal consistency reliability means that multiple indicators can be aggregated to measure a unifying construct in one logical direction. The general criteria for assessing convergent validity and internal consistency reliability in a PLS path model used in this study were:

- The loading coefficients for most of the items that constitute each factor should be strong ($\geq$ 0.5).
- The average variance explained by the indicators that comprise each factor should ideally be at least 50%.
- The internal consistency reliability (Cronbach's alpha coefficient) for the indications that constitute each factor should ideally be ≥ 0.6. (Wetzels, Odekeren-Shroder & van Oppen 2009).

5.3 Interpreting the structural model

Having established the quality of the measurement model, the next stage was to interpret the structural model in terms of the β coefficients and the R^2 values. The single-headed arrows drawn between pairs of latent variables (refer Figure 4.3) represented the β coefficients (which were equivalent to the weighted partial regression coefficients in a multiple linear regression model). Given they were standardised; the β coefficients could range in value from −1 to +1. The β coefficients indicate the relative strengths and directions (positive or negative) of the correlations between the latent variables, after the correlations between the other latent variables have been removed or partialled out. Each R^2 value measured the proportion of the variance in a latent variable explained by the variance in the latent variable(s) flowing into it.

An R^2 value of at least 25% was considered to represent a substantial effect size (Wetzels, Odekeren-Shroder & van Oppen 2009). The statistical significance of each β coefficient was estimated by bootstrapping. This process was conducted automatically by *Smart-PLS*, without intervention by the researcher, involved drawing 100 random samples repeatedly from the data

with 30 cases in each sample. The mean and the standard error of each β coefficient were then computed. The hypothesis that the mean value of each β coefficient was significantly different from zero at the conventional α = 0 .05 level of statistical significance was tested automatically by the software using two-tailed *t* statistics.

5.4 Results

5.4.1 Screening and cleaning of data

The frequency distributions of the responses were tabulated and were checked for erroneous or missing values (see Appendix A). There were no missing or erroneous values among the responses to the items concerning citizenship, the regions where most of the project were located, or the types of project.

The 419 participants provided 12,989 responses concerning PMP, of which the vast majority (*n* = 12,595, 97.0%) were correctly recorded using a 5-point Likert response format, coded by 1, *Strongly Disagree*; 2, *Disagree*; 3, *Neutral,* 4, *Agree*; 5, *Strongly Agree*. The remainder of the responses (*n* = 394, 3.0%) were recorded as *Not Applicable.* No clear patterns were observed among the distribution of the *Not Applicable* responses. They appeared to be randomly scattered throughout the data matrix, and were not systematically related to any specific respondents, groups of respondents, or items.

Appropriate replacement scores for *Not Applicable* could not be computed or predicted. The decision was made to replace the *Not Applicable* responses by a score of 3, *Neutral.* This replacement was logical because it was assumed that if a respondent thought that the item was not applicable then they would also have a neutral opinion about the item. The replacement of *Not Applicable* by *Neutral* resulted in the frequency of the *Neutral* responses increasing the total from 2,498 (19.2%) before replacement to a total of 2,892 (22.2%) after replacement (see Appendix A).

5.4.2 Demographic and contextual characteristics of the respondents

The 419 respondents who completed the questionnaire were classified into two populations. The largest population ($N = 337$, 80.4%) reported that they worked for a Saudi organisation (i.e., their company was based in Saudi Arabia). The smallest population ($N = 82$, 19.6%) reported that they worked for an international organisation (i.e., their company was based overseas) (Figure 5.1).

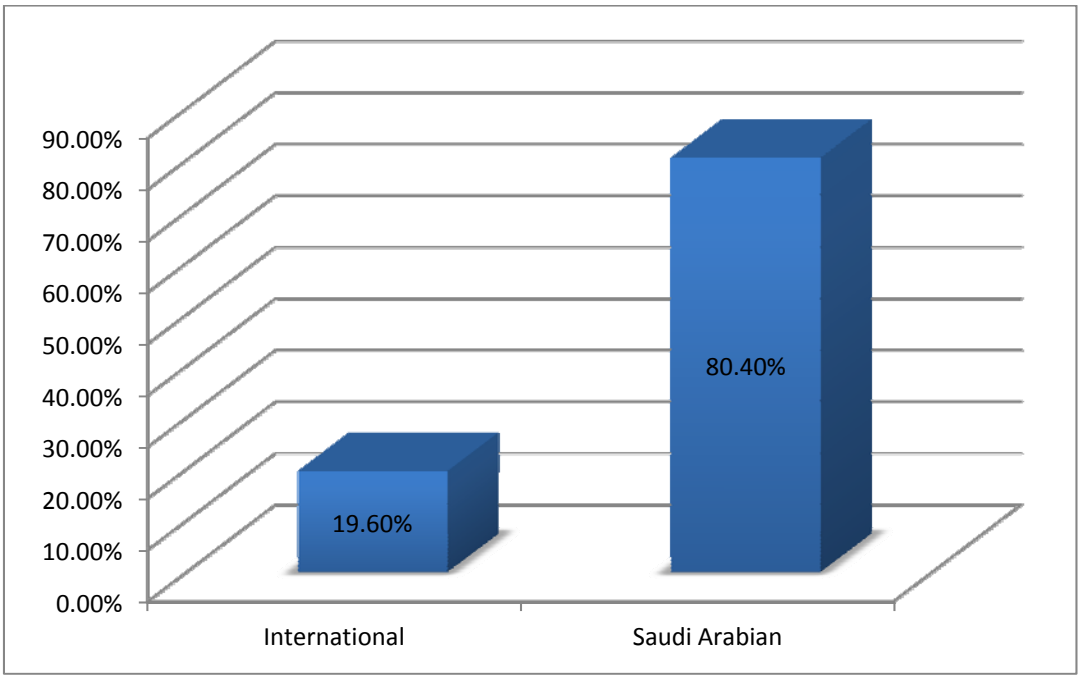


Figure 5.1 Distribution responses according to organisations

For comparative purposes, the frequencies of the demographic and contextual characteristics of the respondents were cross-tabulated with respect to these two types of organisation. The cross-tabulations are presented in Table 5.3.

Table 5.3 Demographic and contextual characteristics of the respondents

Characteristic	Category	Saudi Organisation *N* = 337		International Organisation *N* = 82		Total *N* = 419	
		f	percent	*F*	percent	*f*	percent
Citizenship	Non-Saudi	257	76.3%	76	92.7%	333	79.5%
	Saudi	80	23.7%	6	7.3%	86	20.5%
Regions where most projects were located	Central	201	59.6%	51	62.2%	252	60.1%
	Western	159	47.2%	41	50.0%	200	47.7%
	Eastern	141	41.8%	32	39.0%	173	41.3%
	Southern	80	23.7%	20	24.4%	100	23.9%
	Northern	61	18.1%	16	19.5%	77	18.4%
Types of project	Commercial	143	42.4%	33	40.2%	176	42.0%
	Industrial	117	34.7%	27	32.9%	144	34.4%
	Residential	120	35.6%	17	20.7%	137	32.7%
	Highway Construction	56	16.6%	10	12.2%	66	15.8%
	Heavy Construction	54	16.0%	12	14.6%	66	15.8%
	Telecommunications	43	12.8%	19	23.2%	62	14.8%

Over three quarters (n = 333, 79.5%) of the respondents were non-Saudi citizens. Their projects were mainly located in the central region (n = 252, 60.1%) and/or western region (n = 200, 47.7%) of Saudi Arabia (Figure 5.2).

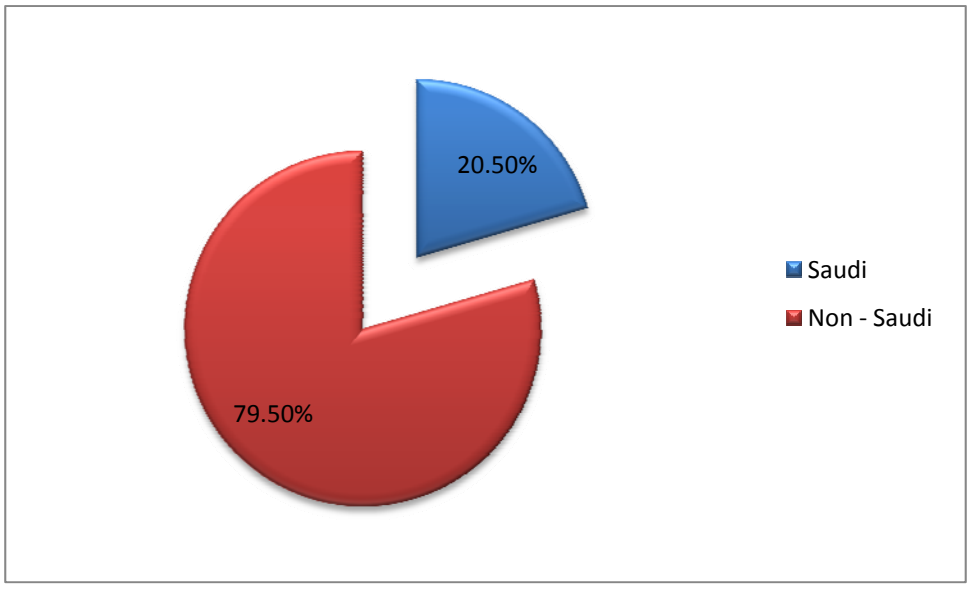


Figure 5.2 Distribution responses according to nationalities

Most projects developed by Saudi organisations were described as commercial, including towers, hospitals, schools, shopping centres, warehouses, and hotels (n = 176, 42.0%); and/or industrial, including manufacturing, power generation, petroleum (n = 144, 34.4%) and/or residential (n = 137, 32.7%) including houses and apartments. Highways, heavy construction, and telecommunications each represented less than 16% of the total number of projects reported by the respondents (Figure 5.3).

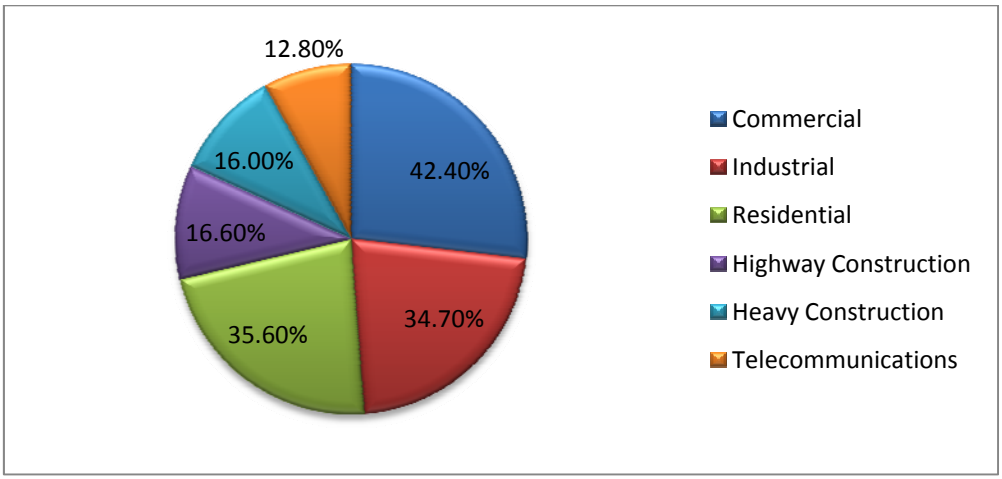


Figure 5.3 **Distribution responses according to types of projects, Saudi organisations**

Projects developed by non-Saudi organisations fell into similar categories, differing only in percentages (Figure 5.4).

Pearson's Chi-square tests were conducted using cross-tabulated frequencies to establish variable relationships. Whether the respondents worked for a Saudi or an international organisation was significantly associated at $\alpha = .05$ with their citizenship ($\chi 2, 1 = 10.90$, $p = .001$). This association arose because (a) the proportion of non-Saudi respondents in the international organisations (92.7%) was higher than the proportion in the Saudi organisations (76.3%) and (b) the proportion of Saudi respondents in the international organisations (7.3%) was lower than the proportion in the Saudi organisations (23.7%).

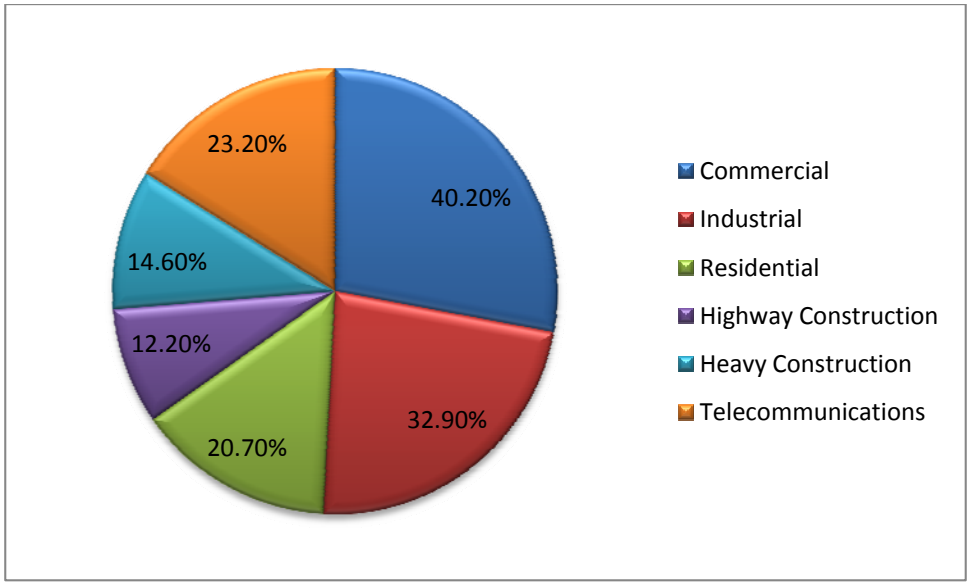


Figure 5.4 **Distribution responses according to types of projects, non-Saudi organisations**

Whether the respondents worked for a Saudi or an international organisation was not significantly associated with the regions where most of their projects were located ($\chi 2, 4 = 0.313, p = .987$) nor with their different types of project ($\chi 2, 5 = 10.04, p = .074$). Although the two populations were not equivalent in terms of their ethnic compositions, they were similar in terms of the distributions of projects in which they were involved.

5.4.3 Descriptive analysis of project management performance variables

Eight PMP variables were operationalised by averaging the item scores that constituted each variable. The frequency distributions of the eight variables are illustrated using histograms in Figure 5.5 (for Saudi organisations) and Figure 5.6 (for international organisations). Although the shapes of the frequency distributions deviated from perfect bell-shaped normal curves and tended to be skewed, with the mode on the right hand side, the frequency distributions appeared to be sufficiently dome shaped to warrant summarisation by parametric statistics.

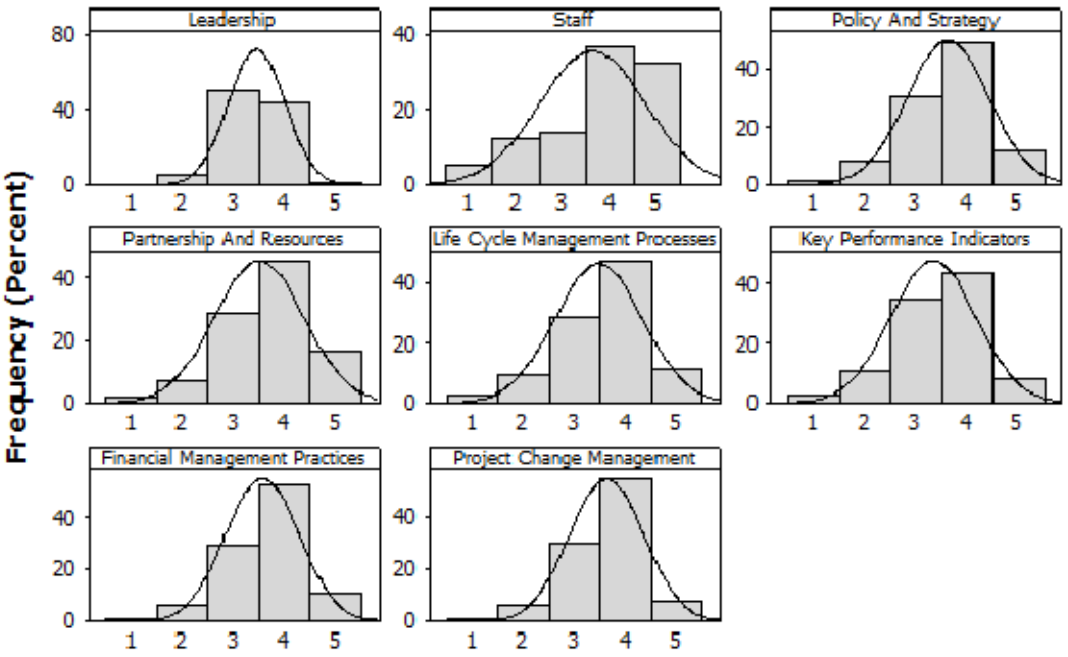


Figure 5.5 **Distributions of project management variables for Saudi organisations**

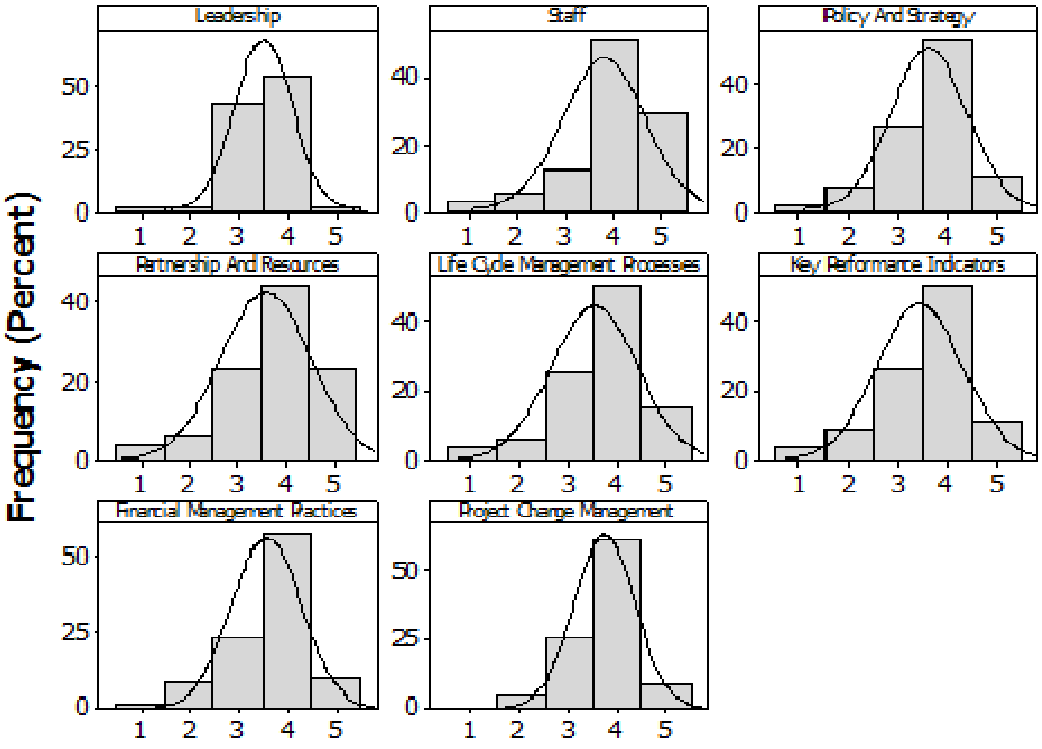


Figure 5.6 **Distributions of project management variables for international organisations**

The central limit theorem (CLT) was also applied for parametric testing. The CLT implied that, regardless of the population's distribution, provided the sample size was sufficiently large, then the distribution of the sample means should be approximately normal, and the sample mean should approximate the population mean (Allen & Yen 2002).

The descriptive statistics (mean scores ± 95% CI) were compared visually using error bar charts in Figure 5.7 (for Saudi organisations) and Figure 5.8 (for international organisations). These charts illustrate that the descriptive statistics for each of the eight PMP variables were consistently lower for the Saudi organisations (M = 3.32 to 3.62) than for the international organisations (M = 3.44 to 3.88). In terms of the hierarchy of the mean scores for the two populations, ordered from the lowest to the highest, the patterns of the mean scores were very similar.

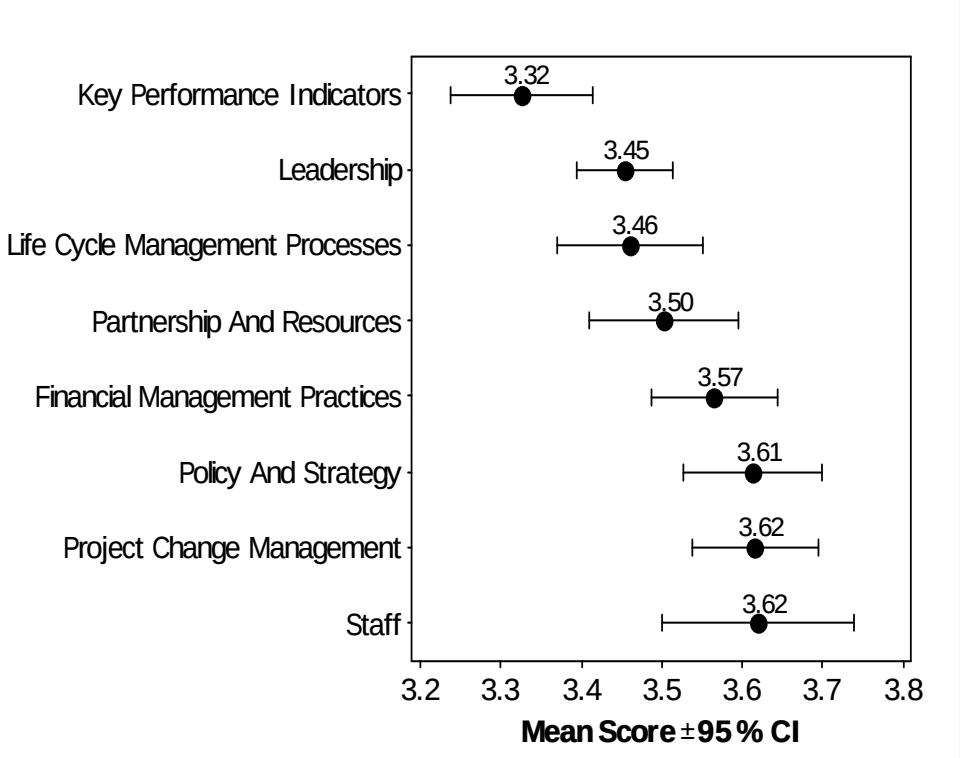


Figure 5.7 **Error bar chart of project management variables for Saudi organisations**

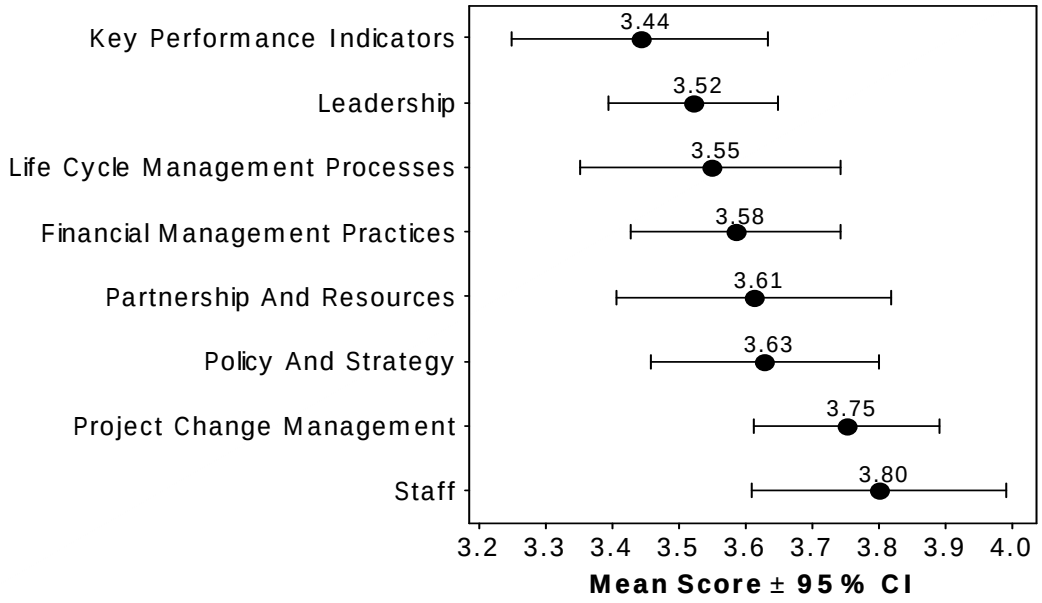


Figure 5.8 **Error bar chart of project management variables for international organisations**

The lowest mean scores were for key performance indicators, leadership, life cycle management processes, partnerships and resources, and financial management practices. The highest mean scores were for policy and strategy, project management change, and staff. The highest level of agreement between both the Saudi and international organisations (M = 3.62 and 3.80 respectively) was for the two items relating to staff (i.e., there was a procedure to increase project management capability through the development of team members, and there was a formal process for evaluating the project management staff).

The lowest level of agreement among both the Saudi and international organisations *(M* = 3.32 and 3. 44 respectively) was for the four items relating to *key performance indicators* (i.e., the method of managing the important KPIs) developed in the organisation. There was a method developed to manage project objectives and link delivery of project benefits post implementation; there was a procedure for measuring stakeholder perceptions; and a method for measuring performance against a wide range of KPIs, in particular to increase organisational capability.

The relationships between the eight PMP variables are indicated by a matrix of correlation coefficients for the Saudi organisations in Table 5.4 (Pearson's *r* = 0.333 to 0.672) and for the

international organisations in Table 5.5 (Pearson's $r = 0.224$ to 0.783). All the correlation coefficients were statistically significant at $\alpha = .05$, reflecting extensive multi-colinearity (i.e., there were strong linear inter-relationships between all of the variables).

Table 5.4 Correlation matrix between project management variables for Saudi organisations

Variable	Leadership	Staff	Policy & Strategy	Partnership & Resources	Life Cycle Mgmt. Process	KPI's	Financial Mgmt. Practice
Staff	0.443*						
Policy & Strategy	0.466*	0.591*					
Partnership & Resources	0.333*	0.338*	0.360*				
Life Cycle Management Processes	0.399*	0.659*	0.531*	0.441*			
Key Performance Indicators	0.421*	0.626*	0.568*	0.379*	0.661*		
Financial Management Practices	0.423*	0.611*	0.550*	0.334*	0.626*	0.635*	
Project Change Management	0.445*	0.651*	0.594*	0.431*	0.672*	0.671*	0.662*

Note: Significant at $\alpha = .05$

Table 5.5 Correlation matrix between project management variables for international organisations

Variable	Leadership	Staff	Policy & Strategy	Partnership& Resources	Life Cycle Mgmt. Process	KPI's	Financial Mgmt. Practice
Staff	0.489*						
Policy & Strategy	0.580*	0.706*					
Partnership & Resources	0.412*	0.540*	0.608*				
Life Cycle Management Processes	0.528*	0.667*	0.783*	0.690*			
Key Performance Indicators	0.377*	0.573*	0.654*	0.614*	0.706*		
Financial Management Practices	0.497*	0.530*	0.557*	0.495*	0.690*	0.706*	
Project Change Management	0.224*	0.279*	0.333*	0.269*	0.427*	0.690*	0.710*

Note: Significant at $\alpha = .05$

5.5 Testing the theoretical models with structural equation modelling

Two PLS path models were constructed in order to compare the relationships between the PMP variables for two populations of respondents. The first model was based on the survey data provided by $N = 337$ respondents working in Saudi organisations. The second model was based on the survey data provided by $N = 82$ respondents working in international organisations. The construction of each model involved two steps (a) evaluating the quality of the measurement model and (b) interpreting the structural model, as explained in subsections 5.5.1 and 5.5.2.

5.5.1 Quality of the measurement model

The quality criteria output by *Smart-PLS* to evaluate the measurement models of Saudi and international organisations in terms of the factor loading coefficients between the indicators and latent variables are presented in Table 5.6. The factor loading coefficients for all but three of the indicators were strong (0.5 to 0.9). The three indicators with weak factor loading coefficients (< 0.5) were (a) Item L4 for Saudi and international organisations (0.375 and 0.401 respectively), (b) Item L5 for Saudi organisations (0.077).

Item L4 was concerned with the absence of one feature of a project culture being covered by the existence of another feature, and Item L5 was concerned with the project environment hindering the development of a project culture. The frequency distributions of the responses to Items L4 and L5 were distinctly different from the other three items that constituted the leadership variable.

The responses to Items L4 and L5 were skewed toward the lower (disagreement) end of the 5-point scale, whereas the responses to Items L1, L2, and L3 were skewed toward the higher (agreement) end of the 5-point scale (see Appendix A). Consequently, with the exception of these three indicators, which did not fit the leadership construct, the model met the required quality criteria with respect to the factor loading coefficients.

Table 5.6 Quality criteria for the measurement models of Saudi and international organisations

Latent Variable (Factor)	Item	Factor Loading (Correlation between Item and Factor)	
		Saudi Organisations	International Organisations
Leadership	L1	0.505	0.504
	L2	0.778	0.707
	L3	0.784	0.720
	L4	0.375 [a]	0.401 [a]
	L5	0.077 [a]	0.563
Staff	S1	0.909	0.879
	S2	0.915	0.836
Policy and strategy	PS1	0.763	0.851
	PS2	0.693	0.813
	PS3	0.837	0.706
Partnerships and resources	PR1	0.898	0.802
	PR2	0.687	0.856
Life cycle management processes	LP1	0.739	0.842
	LP2	0.818	0.799
	LP3	0.772	0.851
	LP4	0.850	0.805
Key performance indicators	KPI1	0.809	0.886
	KPI2	0.795	0.811
	KPI3	0.725	0.852
	KPI4	0.819	0.821
Financial management practices	F1	0.686	0.783
	F2	0.779	0.843
	F3	0.599	0.715
	F4	0.722	0.583
	F5	0.513	0.491
	F6	0.711	0.648
Change management	CH1	0.769	0.800
	CH2	0.823	0.814
	CH3	0.756	0.813
	CH4	0.560	0.477
	CH5	0.764	0.714

Note [a] Weak factor loading coefficient (< 0.5)

The quality criteria output by *Smart-PLS* to evaluate the measurement models of Saudi and international organisations in terms of the average variance explained (AVE), the internal consistency reliability (Cronbach's alpha) and the effect size (R^2) are presented in Tables 5.7 and 5.8 respectively.

Table 5.7 Quality criteria for the measurement model of Saudi organisations

Latent variable	Average variance explained	Cronbach's alpha	R^2
Staff	83.1%	0.797	27.2%
Partnerships and resources	63.9%	0.457 [b]	13.9% [c]
Life cycle management processes	63.4%	0.807	47.4%
Key performance indicators	62.1%	0.796	52.7%
Policy and strategy	58.8%	0.649	25.9%
Change management	54.7%	0.789	27.1%
Financial management processes	45.4% [a]	0.756	48.7%
Leadership	32.4% [a]	0.439 [b]	

Note: [a] Low convergent validity; [b] Low reliability [c] Low R^2

Table 5.8 Quality criteria for the measurement model of international organisations

Latent variable	Average variance explained	Cronbach's alpha	R^2
Staff	73.6%	0.642	28.4%
Key performance indicators	71.1%	0.864	61.4%
Partnerships and resources	68.9%	0.549 [b]	18.5% [c]
Life cycle management processes	68.2%	0.845	66.0%
Policy and strategy	62.8%	0.700	37.6%
Change management	50.1%	0.739	5.9% [c]
Financial management processes	47.3% [a]	0.770	46.2%
Leadership	35.0% [a]	0.538 [b]	

Note: [a] Low convergent validity; [b] Low reliability [c] Low R^2

Convergent validity for six of the latent variables was established by satisfying the minimum AVE criterion (> 50%). *Financial management processes* (AVE = 45.4% and 47.3% respectively) and *leadership* (AVE = 32.4% and 35.0% respectively) did not, however, satisfy this criterion for both Saudi and international organisations.

The reliability of six of the latent variables was established by satisfying Cronbach's alpha > 0.6. *Partnerships* and *resources* (alpha = 0.457 and 0.548 respectively) and *leadership* (alpha = 0.439 and 0.538 respectively) were not reliably measured. The effect sizes were substantial (R^2 > 25.0%) with the exception of (a) the effect of *leadership* on *partnerships* and *resources* (R^2 = 13.9% and 18.5% respectively) in the models of Saudi and international organisations, and (b) the effect of *leadership* on *change management* in the model of international organisations (R^2 = 5.9%).

5.5.2 Interpretation of the structural model

The PLS path diagrams displaying the path coefficients between the eight latent variables are presented in Figure 5.9 for Saudi organisations and in Figure 5.10 for international organisations.

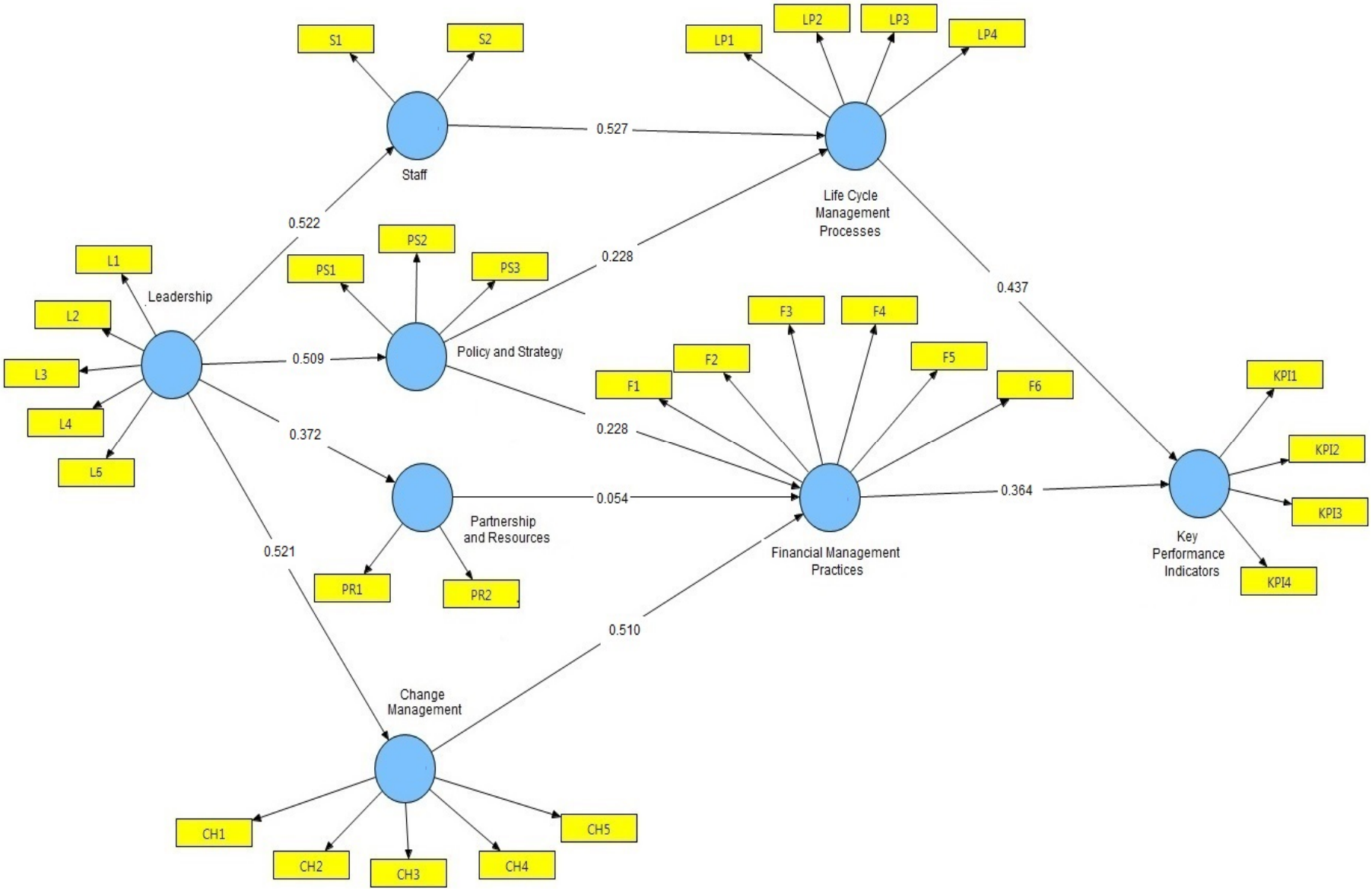


Figure 5.9 Path coefficients for PLS path model of Saudi organisations

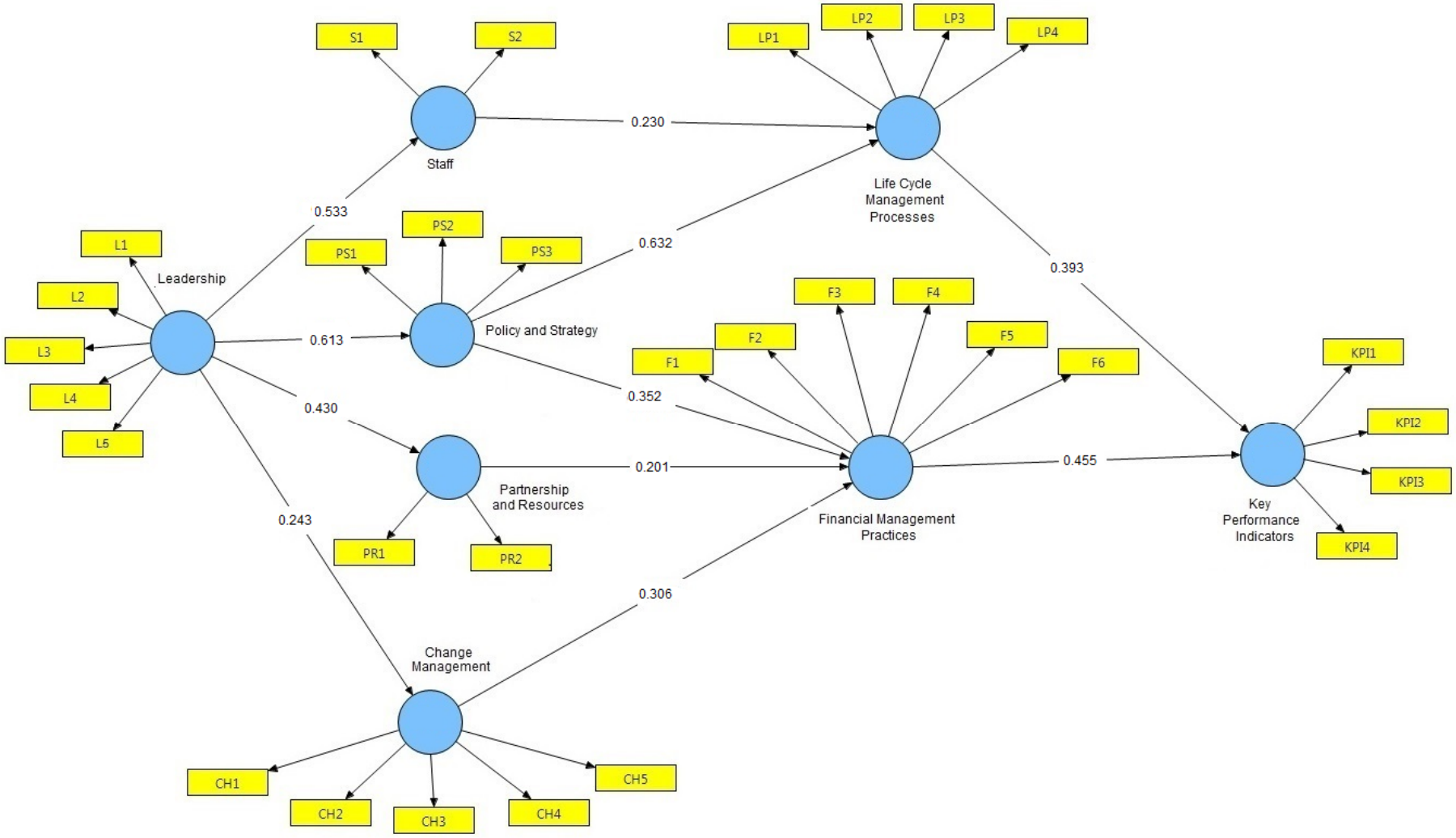


Figure 5.10 Path coefficients for PLS path model of international organisations

The results of *t*-tests to determine if the path coefficients were significantly different from zero are presented in Table 5.9 for Saudi organisations and in Table 5.10 for international organisations.

Table 5.9 Statistical significance of path coefficients (β) between latent variables in structural model of Saudi organisations computed by bootstrapping

Path		B	*T*	*p*
H5:	Staff →Life Cycle Management Processes	0.527	4.50	<.001*
H1:	Leadership → Staff	0.522	6.62	<.001*
H4:	Leadership →Change Management	0.521	6.37	<.001*
H9:	Change Management →Financial Management Practices	0.510	5.56	<.001*
H2:	Leadership →Policy and Strategy	0.509	6.55	<.001*
H10:	Life Cycle Management Processes →Key Performance Indicators	0.437	4.57	<.001*
H3:	Leadership →Partnerships and Resources	0.372	3.59	<.001*
H11:	Financial Management Practices →Key Performance Indicators	0.364	3.78	<.001*
H6:	Policy and Strategy →Life Cycle Management Processes	0.228	2.13	.033*
H7:	Policy and Strategy →Financial Management Practices	0.228	2.13	.033*
H8:	Partnerships and Resources →Financial Management Practices	0.054	0.63	.529

Note: * Path coefficient is significantly different from zero at α = .05

Table 5.10 Statistical significance of path coefficients (β) between latent variables in structural model of international organisations computed by bootstrapping

Path		B	*T*	*p*
H6:	Policy and Strategy →Life Cycle Management Processes	0.632	8.20	<.001
H2:	Leadership →Policy and Strategy	0.613	6.81	<.001*
H1:	Leadership →Staff	0.533	5.80	<.001*
H11:	Financial Management Practices →Key Performance Indictors	0.455	4.83	<.001*
H3:	Leadership →Partnerships and Resources	0.430	4.10	<.001*
H10:	Life Cycle Management Processes →Key Performance Indictors	0.393	4.02	<.001*
H7:	Policy and Strategy →Financial Management Practices	0.352	3.36	.001*
H9:	Change Management →Financial Management Practices	0.306	3.40	.001*
H4:	Leadership →Change Management	0.243	3.01	.003*
H5:	Staff →Life Cycle Management Processes	0.230	2.91	.004*
H8:	Partnerships and Resources →Financial Management Practices	0.201	1.91	.056

Note: * Path coefficient is significantly different from zero at α = .05

All the path coefficients were statistically significant at $\alpha = .05$ with the exception of (a) *partnerships* and *resources* → *financial management practices* ($p = .529$) in the model of Saudi organisations, and (b) *partnerships* and *resources* → *financial management practices* ($p = .056$) in the model of international organisations. Consequently, the strengths of these relationships were assumed negligible, irrespective of whether the organisations were located in Saudi Arabia or anywhere else.

In the Saudi organisations, the highest path coefficients ($\beta \geq 0.5$), reflecting the most substantial effects, were the relationships between *staff* →*life cycle management processes* ($\beta = 0.527$); *leadership* → *staff* ($\beta = 0.522$); *leadership* → *change management* ($\beta = 0.521$); *change management* → *financial management practices* ($\beta = 0.510$); and *leadership* → *policy and strategy* ($\beta = 0.509$). In the international organisations, the highest path coefficients ($\beta \geq 0.5$), reflecting the most substantial effects, were the relationships between *policy and strategy* → *life cycle management processes* ($\beta = 0.632$); *leadership* → *policy and strategy* ($\beta = 0.613$); *leadership* → *staff* ($\beta = 0.533$) and *financial management practices* → *key performance indicators* ($\beta = 0.455$).

5.5.3 Differences between Saudi and international organisations

The main differences indicated by the relative magnitudes of the path coefficients were:

a) the effect of *life cycle management processes* on *key performance indicators* was higher in Saudi organisations ($\beta = 0.437$) than in international organisations (0.393)
b) the effect of *financial management practices* on *key performance indicators* was lower in Saudi organisations ($\beta = 0.437$) than in international organisations ($\beta = 0.455$)
c) *change management* had a substantial effect on *financial management practices* in Saudi organisations ($\beta = 0.510$) but this effect was relatively small in international organisations ($\beta = 0.306$)
d) the effect of *staff* on *life cycle management processes* was substantial ($\beta = 0.527$) in Saudi organisations, but relatively small in international organisations ($\beta = 0.230$).

5.5.4 Revision of PLS path models

The quality criteria reported earlier in Table 5.7 for the model of Saudi organisations indicated that the convergent validity was low for *financial management practices* and *leadership* (AVE < 50%) whilst the internal consistency reliability was low for *partnerships* and *resources* (Cronbach's alpha = 0.457) and *leadership* (Cronbach's alpha = 0.439). The quality criteria reported previously in Table 5.8 for the model of international organisations indicated that the convergent validity was low for *financial management practices* and *leadership* (AVE < 50%) whilst the internal consistency reliability was low for *partnerships* and *resources* (Cronbach's alpha = 0.549) and *leadership* (Cronbach's alpha = 0.538).

The results of the *t*-tests in Tables 5.9 and 5.10 indicate that the path coefficients between *partnerships* and *resources* and *financial management practice* were not significantly different from zero. Consequently, the two models were revised to improve the convergent validity and internal consistency reliability of the latent variables, and to exclude the non-significant path coefficients. To optimise the models, all indicators with weak factor loadings less than 0.7 were excluded.

The PLS path diagrams displaying the path coefficients between the seven latent variables for the revised models are presented in Figure 5.9 for Saudi organisations and in Figure 5.10 for international organisations. The quality criteria output by *Smart-PLS* to evaluate the revised measurement models of Saudi and international organisations in terms of the average variance explained (AVE), the internal consistency reliability (Cronbach's alpha) and the effect size (R^2) were presented in Table 5.9 and Table 5.10 respectively.

Adequate convergent validity before the seven latent variables was established by satisfying the minimum AVE criterion (> 50%). The reliability of the seven latent variables was also established by satisfying Cronbach's alpha > 0.6. The effect sizes were substantial ($R^2 \geq 5.0\%$) with the exception of the effect of *leadership* on *change management* in the model of international organisations ($R^2 = 10.4\%$). In this model, the effect of *leadership* on *change management* was weaker than in the model of Saudi organisations ($R^2 = 25.3\%$).

The results of *t*-tests to determine if the path coefficients were significantly different from zero indicated that all were statistically significant at $\alpha = .05$. Consequently, the validity, reliability, and

statistical significance of the revised models were improved by excluding all the weak indicators. The revised models are therefore, assumed to be optimised for the purposes of this study.

5.5.5 Summary

Valid responses to the survey questionnaire with no missing values were collected from $N = 419$ participants. The participants were divided into two populations, the largest of which ($N = 337$, 80.4%) worked for a Saudi organisation, and the smallest ($N = 82$, 19.6%) worked for an international organisation. Over three quarters of the respondents were non-Saudi citizens. Their projects were mainly located in the central region and/or western region of Saudi Arabia.

Most projects were described as commercial and/or industrial. Eight PMP variables were operationalised. The mean scores, using a 5-point scale (1 = *Strongly Disagree* to 5 = *Strongly Agree*) were consistently lower for the Saudi organisations than for the international organisations. The lowest mean scores were for *key performance indicators*, *leadership*, *life cycle management processes*, *partnerships* and *resources*, and *financial management practices*. The highest mean scores were for *policy and strategy*, *project management change*, and *staff*.

The highest level of agreement between the two populations was for items relating to *staff*, specifically processes to increase project management capability through the development of team members, and evaluating staff. The lowest level of agreement between the two populations was for items relating to *key performance indicators* (KPIs), specifically managing KPIs and project objectives, linking the delivery of post implementation project benefits; measuring stakeholder perceptions; and developing organisational capability. A correlation matrix indicated statistically significant ($p < .05$) relationships between the eight PMP variables, reflecting extensive multi-collinearity.

Two partial least squares (PLS) structural equation models, one for each population of respondents, were constructed in order to compare the relationships between the eight PMP variables. PLS path modelling using *Smart-PLS* software was chosen in preference to covariance-based modelling using *AMOS* software because of its less restrictive data requirements and its emphasis on exploratory rather than confirmatory modelling. The questionnaire item scores were used as reflective indicators to construct each latent variable by factor analysis. The modelling process involved two steps: evaluating the quality of the measurement model and interpreting the structural model.

The quality of the two preliminary PLS path models was inadequate because (a) some of the indicators had low factor loading coefficients (< 0.7); (b) the convergent validity (AVE < 50%) and reliability (Cronbach's alpha < 0.6) was inadequate for two of the latent variables. In the models of the Saudi and the international organisations, the effect sizes were low (< 25%) for the relationships between *leadership → partnerships and resources*; and between *leadership → change management*. All the path coefficients were statistically significant ($p < .05$) with the exception of (a) *partnerships and resources → financial management practices* in the model of Saudi organisations; and (b) *partnerships and resources → financial management practices* in the model of international organisations.

Because their quality criteria were inadequate, the two preliminary models were revised in order to improve the convergent validity and internal consistency reliability of the latent variables, and to exclude the non-significant path coefficients. By excluding indicators with weak factor loadings (< 0.7) and one latent variable (*partnerships and resources*), adequate convergent validity (AVE > 50%) and reliability (Cronbach's alpha > .6) were established for seven latent variables in the two revised models. All the path coefficients were significantly ($p < .05$) different from zero, and all the effect sizes between the latent variables were substantial ($R^2 \geq 25.0\%$) with the exception of *leadership → change management* ($R^2 = 10.4\%$) in the model of international organisations. Consequently, the validity, reliability, and statistical significance of the revised models were improved by excluding all the weak indicators and the revised models were optimised for the research thesis.

The PLS path models for the two populations were not the same. The main differences between the models constructed for the two populations reflected different functions of *leadership* in Saudi and international organisations. In the international organisations, the importance of *leadership*, expressed in terms of the magnitudes of the path coefficients, appeared to different to the importance of *leadership* in the Saudi organisations. In the Saudi organisations, the strongest relationships ($\beta \geq .5$) were between variables associated with *leadership, staff,* and *management processes*, specifically between *leadership → staff* ($\beta = 0.530$); *change management → financial management practices* ($\beta = 0.527$); *leadership → change management* ($\beta = 0.503$); and *leadership → policy and strategy* ($\beta = 0.490$).

In international organisations, the strongest relationships (β > .5) were associated with *policy and strategy*, *leadership*, and *management processes*, specifically between *policy and strategy* → *life cycle management processes* (β = 0.633); *leadership* → *policy and strategy* (β = 0.506); *leadership* → *staff* (β = 0. 554); and *policy and strategy* → *financial management practices* (β = 0.503). In international organisations the relationship between *leadership* → *change management* was weaker (β = 0.323) and the *staff* →*life cycle management processes* was the weakest (β = 0.230).

The overall conclusion of this study is that the PLS path models predicted that:

- In the Saudi organisations, *staff* and *change management* were the most important functions of *leadership*, whereas in the international organisations, *staff* and *policy and strategy* were the most important functions of *leadership*.
- In the international organisations, *leadership* was less important for *change management* than in the Saudi organisations.
- In the Saudi organisations, *staff* was very important for *life cycle management processes*, whereas in international organisations, the relationship between *staff* and *life cycle management processes* was weak.
- In the Saudi organisations, *financial management practices* were mainly a function of *change management*, whereas in international organisations, *financial management practices* were mainly a function of *policy and strategy*.

Chapter Six

DISCUSSION

In this chapter, we address the research questions (RQ1-RQ3) and the research objectives RO1-RO6 and synchronise with the statistical data results from Chapter 5. Apart from a discussion of the demographic characteristics and the research work, this chapter articulates the statistical findings, supported with the relevant literature sources and the researcher's interpretations. In addition, the chapter highlights the differences between the state and non-state owned project performance.

Based on the literature review in Chapter 2 and statistical analyses and results in Chapter 5, the discussion chapter consists of four sections. The first section discusses in general the results outlined in the analyses in Chapter 5. The second section connects the research results to the extensive literature review presented in Chapter 2. Section three discusses practical implications, including the relevance of this study to the Saudi Arabian context. The final section describes the main limitations of this research, which may be a starting point for future studies.

6.1 Discussion of the findings & results

In general, the PMPAC plus *change management* model was confirmed, and the statistical analysis enhanced understanding of the variety of information found during the research. However, some of the relationships were not significant for the research. The practical application and testing of the model was done in the Saudi Arabia organisations as has been described in the methodology chapter. Moreover, the model was tested with two other subgroups, Saudi and non-Saudi organisations, as was discussed in the analyses chapter. The differences between these groups did not have significant impact on the research, though some variances were recognised. It was found that some of the relationships identified in the research were significant for some subgroups of organisations, but were irrelevant for others at the same time.

The significance of the relationships between the construct variables depended on the characteristics of the organisations, which exhibited both similarities and differences from one another that affected the outcomes of the study. A data screening and cleaning exercise with the measurements from non-Saudi or international organisations was accomplished, and the construct and convergence validity and reliability of the data framework were evaluated and showed various implications for Saudi-owned projects and organisations.

Among the responses from Saudi-owned projects, some study variable tests revealed low convergence validity. Specifically, the *leadership* and financial management process had average variance percentages below 50%. This implies that the statistical findings for these two variables did not have content validity and that their use in subsequent studies requires caution and the possible adoption of alternative scales (Pallant 2007).

However, the fact that the same variables had average variance issues for *leadership* and financial management practices has implications, such that their data may have content validity issues. It is possible that the low convergent validity was the result of differences in strategic vision and missions, and different approaches to *leadership* and financial management processes between the Saudi and non-Saudi projects.

To justify the continued use of the data from the *leadership* and financial management practices hypotheses, the researcher invoked tests for the degree of freedom (F) ratio for every applicable sub question within the main hypothesis to ascertain the depth of variability (Pallant 2007). This offered the replacement score criteria mentioned in Chapter 5. Consequently, a bigger F ratio indicated a greater variance among the sub questions in the main variables of the *leadership* hypothesis and the financial management process hypothesis from within rather than across the data groups. The F tests for *leadership* in Saudi organisations recorded a score of p=0.439. For international organisations, the score was p= 0.538. This would suggest that the variances are not equal, but also that the degree of freedom of the leadership data for international organisations is greater, due to the greater ratio.

For financial management process, the F test scores were (p= 0.056) and (p= 0.529) for Saudi and international organisations respectively. All these variables yielded alpha coefficients above p=0.05 (*SPSS* Inc. 2008) as univariate analysis, and this justified their supported use for the rest of the study with mean scores ± 95% as the confirmatory index (CI).

Second, some data variables between the Saudi and non-Saudi projects had low reliability. Specifically, *leadership*, *partnerships and resources* had Cronbach's alpha coefficients below the expected significance level of α=0.6. These findings imply that the statistics for the *leadership* variable tests were not reliable (Tabachnick & Fidell 2001). One of the possible explanations is that the 5-point Likert scale may have been too narrow to measure the *leadership* data validity, even

though the norm is a 5-10 scale (Saunders, Lewis & Thornhill 2007). It was found during the study that a 7-10 Likert scale should have been adopted to improve the interpretations between the Saudi and non-Saudi project *leadership* traits and strengths for success (Dawes 2008). Nevertheless, it was felt important to use the data about project *leadership* and partnerships and resources. Therefore, the mean inter-item correlation was invoked and its lower alpha coefficients of α=0.2 to α =0.4 were suitable for qualifying the *leadership* variable data validity. This lower scale was recommended by Briggs and Cheek (1986) to help researchers facing such data reliability challenges, as opposed to the ideal Chronbach alpha coefficient as stated by Pallant (2007) who said they should be above 0.7. Given the lower alpha coefficients the data would normally have been deleted as indicated by Pallant's (2007) score; however the determination to include the data using Briggs and Cheek's (1986) range supports the justification to include the leadership data. Gliem and Gliem (2003, p. 87) noted that while there is no lower limit to a Cronbach alpha coefficient, the closer to 1.0 'the greater the internal consistency of the items in the scale'.

Third, among the Saudi owned projects, the value effect size denoted as R^2 was examined across all the study variables. The researcher found that the partnerships and resources variable was flagged as the lowest R^2 values for Saudi and the international organisations respectively. This implies that partnerships and resources are managed more poorly for Saudi-owned projects than for international organisations, and that the effect on the project could cause problems and ultimately failure if not addressed (*SPSS* Inc. 2008). Nevertheless, the fact that both the Saudi and international organisations identified the same variable as having an effect size as low as R^2 is an indication of the strong internal consistency of the data (Saunders, Lewis & Thornhill 2007).

6.1.1 Demographic and contextual characteristics of the respondents

The total study population included 419 Saudi and non-citizen participants, and when analysed the projects were mainly located in the central region (n = 252, 60.1%) of Saudi Arabia, within the densely populated area of Riyadh. This number of study participants appears to be the largest to date using the PMPA model or derivative, thereby providing increased generalisations that could be inferred from the findings (Babbie 2007). Furthermore, the larger the sample size, the greater the statistical significance and confidence of the findings.

This study population compared to the Rehman, Usmani and Al-Ahmari (2012) study was considerably larger than that, which was only 27% of the size of the current study. The current study was undertaken across both the public and private sectors across a broader span of industries, including commercial, industrial, residential, construction and telecommunications and enabled the researcher to capture data from a wider range of influences from the variables.

Ali, Al-Sulaihi and Al-Gahtani (2013) study was primarily focused on KPIs in the construction sector of Saudi Arabia, which was only a subset of the current study. The Qureshi, Warraich and Hijazi (2008) that used a PMPA model in a study conducted in Pakistan, had a population sample that was significantly smaller at 50. Of those studies conducted in Saudi Arabia, Alamjed and Mayhew (2013) only focused on the IT sector, as did Alfaadel, Alawirdhi and Al-Zyoud (2012).

The statistical evidence from the sample population showed that almost 80% of the respondents were of non-Saudi or international origin, which is significant, as it reflects the influx of international labour, emphasising the shortage of skilled labour necessary to meet the need for project management supporting Assaf, Al-Khalil & Al-Hazmi (1995), Al-Kharashi and Skitmore (2009), and Almajed, and Mayhew (2013). This shortage of skilled labour can be explained by the exponential growth in the region that increases the demand for skilled labour and the lack of training to meet the demand among the native population (James 2014).

6.1.2 Project management performance variables

Project management leadership

Analysis of the data indicated that from L_1 to L_5 mean, that the international organisations recorded better *project management leadership* approaches their Saudi counterparts. The L_1 survey mean of 50% indicated that the projects of both cohorts were useful in executing business changes in the respective organisations. The current research supported the Bryde (2003a) study, which had found that 63% of the population agreed that projects aid business change, but did not find significant support for the idea that the project created a wider awareness of change and the reasons for change among the staff, even though scoping tends to inform the stakeholders of the objectives.

The L_2 results showed that both the Saudi and international project leaders often contract the right organisation to oversee projects, which corroborates the Bryde (2003a) study. However, it was clear that caution was required based on experience because, while leaders with expertise could be

found, specific attributes were often unavailable. For example, Bryde (2003a) notes that some projects suffer from a lack of appropriate *leadership* when the person available has hard skills, whereas another with soft skills may be required. Therefore, attempts to substitute have often proved futile or costly in many projects government or private managed projects (Qureshi, Warraich & Hijazi 2008).

The research findings from L_3 concurred that culture plays a crucial role in project *leadership* in Saudi Arabia. However, the Bryde (2003a) study supports only two out of eight sub hypotheses that tested the presence of culture as having impact on project *leadership*. The two supported sub hypotheses were those related to communication of project details and information and use of gatherings and festivals to launch projects (Qureshi, Warraich & Hijazi 2008).

Consequently, the L_4 mean outcomes assure both the Saudi and international project leaders that project culture gaps will be resolved by other factors in the project life cycle. According to Bryde (2003a), such knock-on effects eventually delay project completion, or have a negative impact on the cost or quality. Failures of communication due to language barriers between stakeholders are just one example of how a critical issue can be underplayed or ignored to the detriment of the whole project (Bryde 2003a).

Similarly, there is a culture in some organisations of preferring local employees, even though some projects demand high-level skills despite a short supply of suitably trained staff in the country (Saudi Aramco 2010). The number of projects combined with the lack of suitably qualified staff has created a chronic undersupply of labour, as noted by Al-Kharashi and Skitmore (2009). Respondents felt that not having ready access to skilled workforce leaders would ultimately lead to project competency issues. Project competency, as shown by Almajed and Mayhew (2013), is a critical success factor (CFS), without which projects fail.

The research findings support the L_5 results that the project environment can slow down the transition from one phase to another in a project. Bryde (2003a) adds that lack of specific project inputs support this finding and emphasises that the environment must be scanned in advance to highlight any potential problems. Another common problem in the project environment is the lack of team cohesion and the fact that such environments destabilise the overall project performance (Carter Ulrich & Goldsmith 2005). Moreover, if the project team members are geographically

dispersed without adequate communication support, such an environment is prohibitive to building any synergy and the mission may not be achieved (Qureshi, Warraich & Hijazi 2008).

From the hypothetical tests, it was established that project managers must have both soft and hard management skills. This affirms the findings of Alfaadel, Alawirdhi and Al-Zyoud (2012) who stated that the various phases of a project require *leadership* attributes, including soft skills that can be applied as required. These skills and their flexible application, according to Alfaadel, Alawirdhi and Al-Zyoud (2012) are of the highest importance in terms of CSFs for project success. Moreover, the different phases of the project may have cultural overtones that demand sensitive management, and *leadership* could determine the ultimate project success (Qureshi, Warraich & Hijazi 2008). Alternative interior design, for example, may be required for Saudi and international buildings, and a good manager must keep cultural issues in mind for success. Effective project *leadership* skills are also required when there are environmental barriers that threaten the success of the project due to some earlier cultural orientation (Bryde 2003a).

The critical nature of project *leadership* and the undersupply of project managers with the right abilities and experience expose projects in Saudi Arabia to a high degree of risk since there tend to be the assumption that issues will simply be resolved during the project lifecycle. However, results from the current research showed that most respondents did not think the shortage of skilled managers or skilled labour could be adequately resolved without addressing that shortage directly. As Rehman, Usmani and Al-Ahmari (2012) suggested, the two most important factors of project management performance are *leadership* and project lifecycle, then the results of the current study support the idea that nothing can reduce the level of risk associated with inadequate staffing except adequate staffing. Reliance on other factors to make up for a lack of qualified staff will increase the risk of project failure (Al-Kharashi & Skitmore 2009).

Project management staff

The S_1 (There was a procedure to increase capability through development of team members) statements for the project management staff sub-statement-tests among the Saudi and international respondents respectively showed a positive response. The findings clearly indicate that respondents from Saudi organisations agreed more strongly with the development of project staff than respondents from international organisations, although both mean indicators were of a significant

percentage at 91% and 88% rounded. The research findings of S_1 outcomes concur with Bryde (2003) who emphasises in his study that project senior managers must find ways of developing their staff capacities to cope with the business mission and environmental circumstances.

Bryde's (2003a) argument was overwhelmingly affirmed by the results from the current study, based upon the mean percentages supporting the idea that staff development was essential. Some of the capacity building techniques explored by project managers include skill training, team formations, accomplishment rewards and other motivational approaches (Qureshi, Warraich & Hijazi 2008). Specifically, Bryde (2003a) found that the capacity of staff is enhanced by 8% using training and skill development, by 5% using recruitment of appropriate employees, and by 5% using team formations. Nevertheless, the Bryde's (2003a) research makes the point that many organisations often face challenges in their attempts to match specific project management skill based training with staff career development. Although the Bryde (2003a) study notes that 21% of sample organisations had a suitable training process, there were significant deficiencies in implementation, with only one organisation actually following through with training in this aspect.

While the current research findings affirmed that, there were procedures in place to improve staff capabilities with project leaders being aware of these procedures. However, the research did not explicitly explore the actual implementation of the training opportunities or the performance achievements of those undertaking such processes; therefore, conclusions as to the level of the effectiveness of the offerings cannot be drawn. The S_2 results indicated that systems for assessing and appraising staff were in place in the Saudi and international project organisations. This was congruent to the Bryde (2003a) study that found 73% of organisations had systems for recognising their staff input and rewarding those who excelled individually or as part of a team, whereas the current study found 91.5% of Saudi organisations and 83.6% of international organisations had similar systems for staff recognition. No specificity of the types of rewards was determined in the research findings. On the other hand, the Bryde (2003a) study records that about 62% of the organisations surveyed had elaborate staff appraisal and reward schemes, ranging from measuring performances, achievement of focus task objectives, to other broader mandates.
However, Bryde (2003a) observed that only 11% of organisations had developed methods for evaluating managers in various projects, including circumstances under which the overall staff appraisal and development framework was not followed to the letter. This drop in percentage

comparison is a common occurrence where a project manager initially engages to undertake one project and performs beyond expectations, but the evaluations do not count during the periodic appraisal periods (Qureshi, Warraich & Hijazi 2008).

Mir and Pinnington (2014) affirmed the importance of PM staff and their role in project success and the significance of training and staff appraisals, confirming the research of Fortune and White (2006). The results correspond to the results for skilled labour. Whether there is a shortage of qualified staff or the need to provide ongoing training and appraisal, in both instances these factors influence project success and are therefore critical variables that warrant priority in developing project teams and systems.

Project management policy and strategy

For the variables surrounding *policy and strategy*, between Saudi and international organisation projects, the differences between the means from the results for the Saudi-based and the internationally owned organisations were smaller than they had been in relation to expertise, training and recognition. The PS_1 results implied that both the Saudi and international organisation project managers often popularised the merits of the project to achieve public buy-in before it was launched. It is possible that the results are particular to the Saudi region, given the discrepancies in the mean, but comparing them with those of the Mir and Pinnington (2014) study which were lower, with a .477 response rate when associated with project success.

The results of the current research suggest that both the Saudi-based and the internationally owned organisations regard policy and strategy as part of the tool set for promoting organisational enthusiasm. This is reflected in the .763 (Saudi) and .851 (international) percentage responding positively to the importance of PM *policy and strategy* as a tool for marketing projects rather than simply providing frameworks or having direct operational influence over the project (Mir & Pinnington 2014). This analysis would suggest that the value of policy and strategy is heightened in the respondent's mind as many survey participants saw *policy and strategy* as a precursor to success rather than as a means of guiding the project process.

The findings of PM *policy and strategy* practice conform with the findings in the Bryde (2003a) study which show that at least 20% of organisations endeavour to make project staff aware of the organisation's mission and vision. Furthermore, Bryde (2003a) established that even organisations

versatile in project management followed a similar pattern of popularising project benefits from the beginning. This concurs with recent findings related to the strategy of elevating the importance of the project to increase project support and the likelihood of project success. Theoretically, raising awareness of the project and clarifying the goals from the beginning results in greater commitment from the stakeholders (Qureshi, Warraich & Hijazi 2008). Moreover, such project awareness will often yield feedback from beyond the organisation, which can help the managers refine the development processes to achieve a winning outcome for all stakeholders.

The research findings of the PS_2 tests illustrate the fact that the success of projects is based on formal implementation processes. The strategy of engaging stakeholders in project awareness has previously succeeded in overcoming social and political resistance from communities (Qureshi, Warraich & Hijazi 2008). Thus, Bryde (2003a) argues that most organisations have a policy of outlining a project with the public to increase the project profile and to secure successful implementation.

The results of the PS_3, indicate that fast tracking policies and strategies are a multi-agency process in Saudi Arabia, which has hurdles that must be navigated with care for a project to succeed. A similar view is sustained in the Bryde (2003) study, which observes that 15% of respondents lacked a realistic approach, which led to fatigue and eventual delays. Therefore, most projects often include an elaborate *policy and strategy* to ensure that barriers to all phases are eliminated whether at stakeholder, operational or environmental level, all which make up 40% of obstacles according to Bryde (2003).

The most common type of obstacles facing projects appears to be bureaucracies that require excessive approval procedures and eventually stifle innovation among staff (Qureshi, Warraich & Hijazi 2008). However, the significance of *policy and strategy* in project management performance has been rated lowly in both the research studies undertaken by Qureshi, Warraich and Hijazi (2008) and Mir and Pinnington (2014), whereas the current study found *policy and strategy* being given greater importance overall. This result correlates with an observation of Bryde's (2003a) that each phase must be recognised for its individual and collective role in the project chain. Additionally, that project strategies differ in planning and layout and that all these are important for success.

Project management partnerships and resources

In the management of *partnerships and resources*, it was found from PR_1 that the international organisations recorded a stronger mean in support of the tested statements than the Saudi owned projects, and projects having dual partnership approaches with their clients and the suppliers from the planning phases. This finding corroborates the earlier study by Bryde (2003a) who adds that the two-way collaboration is beneficial for the sustainability of the project stakeholders.

Project clients rely in numerous ways on partners, whether via formal or informal avenues, even though not all transactions are successful (Qureshi, Warraich & Hijazi 2008). Bryde (2003a) did not find significant support for partnerships among project suppliers, which implies that some level of competition prevails among them. Nevertheless, there were convergent views that different project suppliers can share a common role (Qureshi, Warraich & Hijazi 2008). Bryde (2003a) argues that some single projects can have multiple partners to secure suppliers and ensure continuity throughout the project. Nonetheless, Almajed and Mayhew (2013) state that the management of partners and suppliers is a critical success factor, and this was despite the weak correlation determined by Rehman, Usmani and Al-Ahmari (2012).

However, Rehman, Usmani and Al-Ahmari (2012) stressed the significance of managing partnerships with all stakeholders, and there may well be value in managing partnerships with specific caveats within the context of the partner's roles, primarily those of stakeholders as opposed to suppliers. It could be argued, as Camilleri (2011) did, that suppliers are an integral representative of stakeholders. However, there are two specific aspects to consider with suppliers' – the competitive nature of tendering contracts for resources and the scarcity of those resources. In the case of a scarce resource, the level of dependency on a supplier who has access to that resource will not only command a higher price, but more importantly, the supplier will be more important as both a supplier and a stakeholder.

The results of the PR_2 (*The project stakeholders were formally involved in the project execution*) indicate that consultations with stakeholders during the implementation phases of a project are especially important. According to Qureshi, Warraich and Hijazi 2008, these consultations include clarifying terms of reference, quality expectations and other detailed terms, even though the compilation of such project manifests could have both internal and external input. Furthermore,

there are tenuous elements of the client-supplier relationship, namely that suppliers are subject to financial pressures and must maintain levels of financial stability as vested stakeholders (Camilleri 2011).

In addition, a good level of communication between the stakeholders is imperative in determining the scope and performance of the deliverables. Generally, there are two main justifications for formally involving a wider group of stakeholders before implementation commences (Bryde 2003a). First, project managers seek discipline throughout, trying to achieve minimal disruption and inconveniences that might derail the mission. Second, projects cannot commence smoothly without formal consultations among critical stakeholders, especially in IT or construction projects. This observation is echoed by Al-Mashari and Al-Mudimigh (2003) who pointed out that a lack of communication is one of the critical failure factors (CFF) in an ERP project. Stakeholder engagement ensures that each partner's role is defined so that the resource requirements and quality evaluations can be schematic (Bryde 2003a), and this can only be effectively achieved through open dialogue with partners and suppliers.

Recognising the importance of project management partnerships and resources in project management requires a wide stakeholders' framework that provides attention to detail at various phases and levels. These findings concur with those of Bryde (2003a) who adds that partnerships and resources are essential in achieving maximum client satisfaction and the streamlining of supply chains. The current research found that partnerships and resource optimisation are instrumental for project sustainability, and that regular updates to the stakeholders on progress and endorsement of next steps is critical.

Project life cycle management process

In terms of the project life cycle (PLC) management process, the LP_1 results are moderate in pointing to the fact that most project managers operate from a master plan followed throughout the entire life cycle of the project. This view is supported by Bryde (2003a) who points out that the organisation must take the lead in defining the project scope and other linkages, such as IT and sequences of execution in order to avert failures. The survey by Bryde (2003a) on the PLC model found 33% of organisations always use, 47% sometimes use, 16% never use and 4% are unaware of its existence. This research study found there were merits in deploying PLC to include integration of TQM for better performance.

The LP_2 (*The role of life cycle models was recognised in developing features of a project culture*) results showed that most respondents agreed that life cycle models connect different project objectives and stakeholders with the expected benefits after the execution is complete. This outcome concurs with Bryde's (2003a) research that records that organisations tend to nurture the PLC, using communication as a culture of connecting with stakeholders, and to ensure the clarity of the project phases. This point is crucial, especially when organisations with ongoing projects are seeking strategic mergers, although their cultural backgrounds are dissimilar (Qureshi, Warraich & Hijazi 2008).

The LP_3 results indicate that most projects have draft work instructions and procedures to guide all phases in the cycle from the planning to the commissioning phases. In agreement with these findings, Bryde (2003a) notes that each project phase, such as planning, scoping, idea creation, launch, completion, post commissioning review and ownership has a unique and vital role in the stakeholders' perceptions of all the practices. Consequently, it is possible for the project managers to plan for risk associated with each project phase and come up with the most appropriate mitigation measure (Qureshi, Warraich & Hijazi 2008).

The most prevalent challenge associated with written procedure for measuring the stakeholders' perception is the lack of sustained supervision and adherence to the pre and post project implementation phases. Bryde (2003a) has also observed that project managers tend to implement the mandatory procedures, but that the execution is partially focused on the reason rather than the process of implementation. Many project-oriented organisations allow managers a degree of freedom to prioritise procedures in order to ensure that all the procedures align with the organisation's overall mission (Qureshi, Warraich & Hijazi 2008).

The results of LP_4 highlight the fact that most project managers update instructions and performance measures along the life cycle after a needs assessment. The study by Qureshi, Warraich and Hijazi (2008) found that the existence of written procedures standardises all the project activities, instils uniformity and assures the clients that the quality will be consistent. Nevertheless, Bryde (2003a) makes the point that only 53% of projects have such project procedural updates, even though the original drafts are available. Conversely, Bryde (2003a) revealed that most project procedural updates conform to requirements. This is especially the case

with regard to legislation, QMS and the sponsors, with the most common reason being that 74% needed to update their project management procedures and 21% for benchmarking purposes.

From the various survey outcomes, it was found that the project life cycle had some specific pathways and models that determined the sustainability within the assigned timeframes. Furthermore, the consolidated survey outcomes for these variables imply that every project must define its life cycle and identify the specific factors, such as cultural practices and operations that are bound to impinge on success if poor management is experienced (Din, Abd-Hamid & Bryde 2011). These findings concur with those of Bryde (2003a), who adds that project life cycles with elaborate designs and processes indicate due diligence, such as written work instructions to which all staff members have access from the beginning to the termination of the project. Additionally, Bryde (2003a) stresses the importance of updating all project work steps and standards so that all staff can have a common understanding and procedure of operations.

Key performance indicators

There are many ways that KPIs can be used by organisations to monitor and measure performance. Bryde (2003a), for example, adopts a psychosocial framework for assessing the achievement of KPIs in projects. Using the PMPA, Mir and Pinnington (2014) argued that KPIs are the most important variable in assessing project success. Previous research has held that there is a need to define targets to be able to measure results in order to achieve project success (Bryde 2005; Thomas & Fernandez 2008; Mir & Pinnington 2014). Ali, Al-Sulaihi and Al-Gahtani (2013) stated that KPIs are the most critical means by which project success can be measured. They provided a means to benchmark the performance and evaluate individual tasks.

Historically, KPIs have been project specific, but the research conducted by Ali, Al-Sulaihi and Al-Gahtani (2013) devised a set of 10 KPIs for construction projects in the KSA. Previously, Bryde (2003a) had stated that in 65% of projects that use KPIs, the KPIs are goal specific. However, the Bryde finding contained gaps because the majority of the participating organisations fail to connect project development with metrics that interrogate management before or after the project (Qureshi, Warraich & Hijazi 2008).

Bryde (2003a) observed that 36% of organisations use KPIs systematically to assess their clients' views of the progress of the project, while those not using this approach are in the advanced stages

of implementing such systems. Typically, a client questionnaire that gathers views after project completion is common practice, although some organisations prefer a phased approach of KPI evaluation. The clarity of such KPIs is normally achieved by composing them in a project workshop (Qureshi, Warraich & Hijazi 2008).

The current research was in line with the results of the KPI_2 variable. That is, projects have both an internal and independent way of verifying the success of their performance. Bryde (2003a) argued that most organisations regularly track a range of issues using a standard KPI framework that is determined before the project begins. The use of this KPI scorecard to assess the progress of a project was common among Bryde's (2003a) sample organisations, with 13 features broadly divided into client and staff KPIs. Qureshi, Warraich and Hijazi (2008) found that the KPIs had a highly significant effect on project performance, similar to the findings of Mir and Pinnington (2014), especially when correlated with other independent variables.

As projects mature, the KPIs can be supported by gathering client views using surveys. Some of the common KPIs fall into the categories of quality performance, project objectivity, efficiency of *change management*, project preparedness from external risks, and continuity of the project life cycle. The termination of the project also has a major KPI evaluation, whereby the clients' expectations are weighed against the sponsors' achievements with appropriate grading criteria (Qureshi, Warraich & Hijazi 2008).

The results of the current study's examination of KPI_3, suggest that most projects have ways of assessing the stakeholders' views about the progress of operations. This observation is supported by Bryde (2003a), who states that the administration of a client questionnaire was a fundamental approach to gathering views about the effectiveness and efficiency of the KPI framework in place in a project. Furthermore, checking project performance against the KPIs proved to be a very useful way of determining if project goals were realistic.

Whereas some projects have a proactive KPI framework, others have a reactive approach and each has advantages and disadvantages (Qureshi, Warraich & Hijazi 2008). It is imperative that organisations develop systems that incorporate KPIs that evaluate both short and long-term effectiveness beyond the iron triangle, in order to achieve continual process improvements and levels of learning (Mir & Pinnington 2014). Ali, Al-Sulaihi and Al-Gahtani (2013) suggested a

specific set of KPIs could be used on a national scale to benchmark project performance. The current research acknowledges both sets of findings and recognises that it is crucial to remain objective in applying and assessing the KPIs in order to avoid sponsor or management bias, given that the clients, as well as management, have clear expectations of what can and should be achieved. A framework such as Ali, Al-Sulaihi and Al-Gahtani (2013) suggested would be highly beneficial in the Saudi construction sector, but perhaps not appropriate in other industry sectors, so flexibility should have to prevail. Overall, given the findings of the current research, it is imperative that KPIs be established for use in determining project success as a variable of performance measure, especially given the levels of project failure.

The research findings from KPI_4 demonstrated that various projects have a set of KPIs to map out the internal capacity and ensure productive developments are implemented. Bryde (2003a) argues that only a few organisations have structures for monitoring KPIs due to a lack of experience, even though the scope of the project determines whether KPIs are useable or not. Furthermore, the level of maturity of the project and the organisational culture also determined whether KPIs were used appropriately (Qureshi, Warraich & Hijazi 2008). Bryde (2003a) notes that organisations that fail to deploy KPIs have excuses, such as negative impacts on project sustainability. They also argue that they cannot use KPIs because of a lack of internal capacity, such as staff qualifications, disregard for continuous improvement or a lack of creativity.

The issue of staff qualifications dovetails with the issue of the availability of staff and the demand pressures in a highly saturated project environment like Saudi Arabia, and serves to emphasise the need for staff training. Any organisation that succeeds in implementing KPIs and aligning them with QMS will cultivate a working discipline that will deliver the project goals appropriately (Qureshi, Warraich & Hijazi 2008).

Research has made it clear that some use of KPIs in projects should be mandatory because their use encourages success since the KPIs serve as procedural benchmarks. Bryde (2003a), who has demonstrated how KPIs connect the project approach with the deliverables produced by the project, supports this finding. Moreover, the current research agreed with the observation that KPIs must have a specific design to make them useful to the stakeholders, who should be able to track

the project and judge its progress (Ali, Al-Sulaihi & Al-Gahtani 2013), and that KPIs need to be relevant to specific industry sectors.

Bryde (2003a) adds that the ability to design KPIs that cover the project phases comprehensively can be considered an illustration of the organisation's capacity to manage the project. The current research recognised the fact that there is an inherent investment and commitment required to develop appropriate KPI measures within a PMPA framework and that the task entails identifying adequate resources, including individuals trained to undertake these assessments. However, the research also made it clear that there is a need to incorporate the spirit of the KPI measures in the organisational culture and at a strategic level. It is not sufficient to develop the appropriate measures of success if they are not supported by the attitudes, behaviours and expectations that guarantee that the KPIs are almost surely going to be achieved. In the long-term, stakeholder participation depends on their faith in the management of the project process as indicated by successfully meeting the KPIs (Mir & Pinnington 2014).

Financial management practices

With regard to the variable of financial management practices, the differences between the results for the Saudi owned and the internationally based projects were very small. This implies that the Saudi organisations and those based internationally both placed a near equal emphasis on prudent financial management. A similar study by Din, Abd-Hamid and Bryde (2011), using *t*-tests, also found no significant differences among the respondents' views on financial management among other PM variables. In addition, the MANOVA did not find significant differences between project management, financial management and project success, with all means above Pillai's trace (0.377) >alpha (0.01), as shown in Table 6.1 (Din, Abd-Hamid & Bryde 2011), p. 1051).

Table 6.1 Differences between project management, financial management and project success

	ISO-certified (*N*=71)		Non-certified (*N*=245)		Tests of between-subjects effects		
Variables	**Mean**	**SD**	**Mean**	**SD**	**η^2**	***F***	**Sig.**
PM practices	3.8127	0.39113	3.5431	0.48501	4.002	18.449	0.000
FM practices	3.7441	0.49828	3.4476	0.60043	4.840	14.426	0.000
Project success	4.1958	0.56327	4.0482	0.51435	1.199	4.341	0.038

In the Din, Abd-Hamid and Bryde (2011) study, one of the hypotheses tested whether firms that induct ISO 9000 into their systems had better financial management practices as opposed to those that were yet to achieve certification. The f-tests had a p-value of 0.000, which implies that the hypothesis was accepted on the benchmark of an alpha of 0.05. Therefore, financial management practices are as important in project management as other project management practices for ISO certified and non-certified firms. Specifically, the Din, Abd-Hamid and Bryde (2011) MANOVA established the following:

> *financial calculation procedure (p=0.000), financial contingency plan (p=0.001), amount loan used (p=0.039), effect of price escalation (p=0.010) and availability of positive financial returns (p=0.049). (p.1050)*

Indeed, Din, Abd-Hamid and Bryde (2011) have proved that each of these tests of financial management were significant at the p value of 0.05 between the ISO 9000 certified and uncertified firms. Furthermore, a test on a financial management aspect of inflation allowance and price escalation that resulted in p=0.067 turned out not to be significantly different.

The F_1 results accorded with the types of projects that engage financial accounting systems or standards, which have been shown by McNally, Smith and Morrison (2011) to conform to some financial calculation procedures as a demonstration of strong governance structures and reporting to the project sponsors. Moreover, having a financial accounting procedure enables the organisation to outline its overall objectives and create discipline in the practices (Bannerjee 2010). In tandem with having an appropriate financial calculation procedure, the employees need adequate training to exercise proficiency in project controls. McNally, Smith and Morrison (2011) posit that such a policy will strengthen the project's financial returns and lower the operational costs.

In comparison, research by Alaghbari, Kadir and Salim (2007) has established the fact that barriers related to project financial management are most likely to cause delays to the completion deadlines. Moreover, most projects are evaluated on their financial value, return on investment (ROI) and potential income in the future (Beatham et al. 2004). Similar views have been expressed by Cook (2004), who added that project financial management is very useful for outlining procedures to be followed during the project change, articulating financial risks facing projects, and reviewing direct and indirect costs that determine the success of the project and its completion.

It should be noted, however, that these approaches to financial management in projects have been discredited by other researchers, who have termed them as shallow and skewed towards the evaluation of project management principles (Manoochehri 1999). Similar dissenting views have been made by Parker (2000) who adds that aspects like project profitability and financial turnover are outdated. Overall, ISO 9000 stresses that project financial management must be defined and tracked thorough out the project life span, so that the impacts can be lessons for other projects.

One measurement tool that would be able to achieve these sorts of measures is the balanced scorecard (BSC) since it provides an equal measure of both short and long-term organisational objectives (Goncalves 2009). The objectives include financial to non-financial and the BSC has a broad perspective that can incorporate the external and internal environments and how they shape performance. The BSC is applicable to project performance assessment and project success (Goncalves 2009).

The results of F_2 for both Saudi and international project-oriented organisations supported the need for contingency finance, a widely held view by many researchers including McNally, Smith and Morrison (2011). Moreover, having a financial contingency plan is essential when the project aims at scaling up to a higher portfolio without having to pause due to shortage of finances (Baccarini 1998; Baccarini 2004). A common way of building up contingency finance is to maintain efficiency in project implementation, which lowers the cost of operation and builds reserves from the different project phases, which could be conducted through the implementation of life-cycle cost analysis (LCCA) (Fuller 2010).

The research outcome shares some similarity, as F_3 indicates, because project managers tend to adhere to the budgets proposed to avoid failure or lesser problems. McNally, Smith and Morrison (2011) also agree with this statement, adding that projects must recognise that budgets are the core function and prudent management guarantees ultimate success. Furthermore, when projects adhere to the plan and the estimated costs, the managers are demonstrating good financial control (Baccarini 2004).

Some of the approaches used by organisations to effect financial control include the integration of best practice tools like *Management of Portfolios* (*MoP*) ™, *Managing Successful Programmes* (*MSP*), and *PRINCE2* (McNally, Smith &Morrison 2011). Advocating these tools and successfully

integrating them as a means by which to monitor financial controls have dual benefits for the organisation. First, the quality of financial reports will be higher which will inspire confidence among the project sponsors who can use such data in decision-making. Second, the establishment of financial control tools will ensure budgetary risks and potential problems with the most common being overspending, are noted in time and mitigated (McNally, Smith &Morrison 2011).

The results of F_4 confirmed the expectation that financial management practices across different types of project often factor in inflationary and price indexation that can increase the overall estimate of the cost of a project (Nicholas & Steyn 2012). Nevertheless, if project managers overlook these factors, the project usually runs into financial problems, especially towards the last phases. McNally, Smith &Morrison (2011) advised that factoring in such indices safeguards that the project managers are aware and can react to any development in the project life cycle.

From the F_5 results, it was determined that project managers prefer to procure material in time to avoid cost escalation. McNally, Smith &Morrison (2011) pointed out that knowledge of the trends in inflation and associated price changes should inform project managers about the right time to procure materials to manage the risk of escalating rates. Monitoring both inflation and price changes enables project managers to make strategic decisions that can affect the success of the project (Hendrickson 2008).

The results of F_6 demonstrated that staff wages are determined using past cost data to ensure the projects are viable. McNally, Smith &Morrison (2011) has illustrated how historical financial data can aid in decision making, such as determining staff wages, and proposes a model, which has systematic layers of decision.

The model provides vital information to the project managers about possible wage caps, especially where there are gaps in information about parts of an organisation, such as a new department. Consequently, the project aggregates available budgetary data from previous financial meetings and, using moving averages, sets up a workable wage forecast that reduces the strain on the rest of the project targets. If a new project department does not have a budget, the model combines historical data and indicates the lowest possible wage levels. If the project manager anticipates a rough guide for staff wages, the model sharpens the estimations and reviews each assumption.

Finally, the model is useful for addressing the departmental apex problems by enhancing cooperation in the decision process for staff wages (McNally, Smith &Morrison 2011).

According to Bryde (2003a), the proof of conceptual association between financial management and project management furthers the need for additional studies on PMPA models. This finding has prompted the modification of the PMPA to suit the construction industry as Project Management Performance Assessment for Construction (PMPAC). In this new case, financial management has been presented as a solid performance indicator. According to Din, Abd-Hamid and Bryde (2011) financial management in projects is validated via multi-collinearity and other direct relations within project management practices and financial management.

Project change management

Data analysis indicated that both Saudi and internationally based organisations have project *change management* in their systems, and that internationally based organisations recorded stronger management skills than those based in the KSA. It could be inferred from the results of CH_1 that both types of organisation used work breakdown structures (WBS) for quality and quantity procedures to ensure adherence to the stipulated budgets and costs. WBS is useful during *change management* because it aids in breaking down complex projects or operations into simpler manageable tasks that can be understood by the implementers and when employed during change it can enable WBS to structure control points that can be used to initiate change (Pellegrinelli 1997). WBS has been employed in cost estimating for change in contingency planning where it can provide a mechanism for accountability by associating changes to individual WBS accounts within the cost structure (Zhao 2006).

Work breakdown structures

With regard to cost management during project *change management*, Zou and Lee (2008) conducted a study of 1221 projects, mostly heavy industries, using ANOVA. Their results indicate that *change management* could lower the actual amount of change cost in relation to the total project costs. This observation means that *change management* is a tool that can be used to facilitate and effect change at various points within the project life cycle while managing costs. The degree to which *change management* can affect actual project costs depends on the *change management* practices employed (Zou & Lee 2008). Therefore, it is important to have a structured

change management plan that includes WBS as it can provide an alignment of staff roles, which can avert an escalation of project budget and costs caused by duplication of tasks. Moreover, projects face serious risks to the delivery of quality outcomes and the achievement of their objectives if the project organisation is confused or misunderstood by the respective personnel during the change process.

Good planning allows *change management* drivers to align with WBS and assist in controlling different metric and budgetary allocations (GAO 2009). At every phase of the project, staff must be aware of their change roles in the project system. The Zou and Lee (2008) study tested the impact of single project change execution on the project change costs. Using ANOVA, the single change effects were tested and the results demonstrated that each change process could be executed separately, although the changes could actually accomplish cost savings by being combined.

For this reason, Stevens (1996) advised that the most important cost factor should be the determinant of the project change strategy, and Zou and Lee (2008) found that individual project changes can influence costs, but furthermore employing project change management practices can reduce overall actual project costs. Zou and Lee (2008) specifically looked at costs within the change management context of projects while Stevens (1996) considered cost as one of a series of CSF's that could be used to assess project quality. This is a significant distinction in that by controlling change management costs as noted by Zou and Lee (2008) there is an individual effect on project costs, while Stevens (1996) requires a culmination of factors to influence costs. Stevens (1996) required a comprehensive approach to measuring project quality and success, which is more grounded in the hard line traditional iron triangle assessment of success (Ofori 2013). Using the Brown-Forsythe F-Tests, Zou and Lee (2008) established that greater project change performance was achievable with the correct project management practices. Additionally, the Levene tests indicated that the chance of escalating costs during project change were lower when certain project management practices were in place (Zou & Lee 2008).

Change processes have specific triggers, which management must comprehend to achieve expected outcomes. When senior management does not understand the WBS, the project could be disordered and the objectives not realised (Susman, Jansen & Michael 2006). The importance of understanding the WBS during *change management* is to align the project to the new environment

and ensure all the strategic phases are implemented with minimum resistance. Moreover, initial understanding of the project WBS is useful for optimising outcomes, speedy planning, collaborating, implementation and enhancing staff to embrace changes (Izzo & Withers 2000).

When Zou and Lee (2008) investigated the impact of *change management* on project change cost performance, they found that it is important to categorise projects according to their costs then measure the effects on the project change practices and the cost elements. The researchers noted that calculating the *change management* practice index would be useful for determining how a project could be controlled whenever costs varied from budgetary specifications. Therefore, project *change management* can also be measured from the different categories of project costs. When Zou and Lee (2008) compared the *change management* practice index and the cost of change in various projects using normality tests, their investigations indicated that bigger *change management* activities yielded lower change cost rates, which are linked to the actual project category.

Bureaucracy has costs and time implications for any project and any project that experiences bureaucratic inefficiencies must resolve them at the earliest opportunity. WBS empowers project staff to proceed with changes as required by their role. Moreover, if a project has a WBS that embraces teamwork, the change process will proceed expeditiously among the phases and interdepartmentally (Kotter & Cohen 2002). In order to achieve project changes in the shortest time, the WBS should be able to indicate the resource needs, and finding and using them will be efficient. This assumption implies, of course, that the project change managers will have the requisite knowledge and skills with regard to WBS and its new functions once the project is commissioned.

Making the most of talented staff during change

The results of CH_2 suggest that both Saudi and international organisations had assessment criteria for reporting on all activities and their impact on cost, quality and punctuality, and there is wide empirical evidence to support the survey findings from the current study. A study by Izzo and Withers (2000), for example, observed that organisations with consistent engagement between the staffs and the change targets achieved an increase in revenue of over 29%. The same study found that such organisations experienced an additional 50% of client loyalty, compared to the industry average, and accompanied with increase in profits of at least 44%.

The empirical evidence of the benefits of *change management* have been noted by Al-Mashari and Al Mudimigh (2003) to the point that the failure of projects can be directly attributed to specific critical failure factors (CFFs) of which poor *change management* is one. Al-Turki (2011) also points out that project implementation success is dependent upon specific factors, and that good *change management* processes are factors that augment project success. The need for senior management support for *change management* in order to achieve project success has also been commented on by Almajed and Mayhew (2013).

Project *change management* must have continuous assessment and a reporting framework for the metrics, such as cost, quality and adherence to schedules, to assure a successful change process. During the change process, the success of assessment criteria, such as cost, quality and timeliness does not happen in isolation. Research shows that the setting of the assessment criteria must bear in mind issues like the organisational dynamics and culture, staff capacity and structures, client objectives and overall project strategy (Smith, Merna & Jobling 2014). There is need for careful implementation of the project assessment criteria, often in light of lessons learned from past changes.

Change planning, staff, team communication and availability of resources, must be considered by the top managers in the organisation, who need to involve the other staff in the change preparation so that they buy into the process and resistance to change is minimised (Kotter & Cohen 2002). Analysis of the data from the current research demonstrated that a *change management* process with articulated assessment criteria would provide the organisation with successful milestones that support its sustainability. The CH_3 results showed that both Saudi and international organisations had proactive staff who participated in any change process according to needs (Hornstein 2008).

It has been noted that proactive employees who seek action, can assume a mandate and implement various project changes themselves (Unsworth & Parker 2003). There is a need for staff to be proactive not merely to promote change, but also to anticipate and foresee potential issues that may arise (Parker, Bindl & Strauss 2010). Employees who are confident and willing to take on responsibilities are able to see opportunities to make improvements and bring about change in the workplace (Parker, Bindl & Strauss 2010). Proactive employees who are goal orientated and willing to act independently require leaders who support and foster this approach in project management. Project leaders can employ project goal orientation as a means to motivate staff to

achieve specific objectives (Parker, Bindl & Strauss 2010). Furthermore, project manager must understand what motivates individuals in order to know what triggers will motivate employees and stakeholders to be more proactive (Parker, Bindl & Strauss 2010).

Partington (1996), some two decades ago, stated that there is a need to adopt a flexible project-based approach to organisational structures. In doing so, organisations would introduce flexibility into their management processes, including a flexible approach to change. Having a positive change environment can only foster increased motivation and facilitate innovative thinking for employees who are both empowered and proactive at resolving issues that occur during projects.

The organisational environment must foster a culture that is open to and embraces innovative thinking, allowing proactive employees to initiate and respond to change without fear of repercussion (Unsworth & Parker 2003). By developing trust within this flexible framework, the organisation, the project managers and staff are free to be innovative and make suggestions. Within this type of environment, project managers need to actively promote proactive thinking and encourage innovative behaviours, giving employees the self-confidence to undertake tasks (Unsworth & Parker 2003).

In summary, the staff in an organisation can only initiate proactive action when encouraged and supported to do so. In a project environment, shifting objectives or the need to implement change can require proactive resolutions to problems, and employees need a supportive infrastructure and *leadership* to implement the required changes.

Initiating, implementing, and executing the change process

In the construction sector, initiating change can be complex and often requires modelling in order be successful (Motawa 2012). It is thus essential that project variable information be complete, especially in the initial stages, as a lack of early information can cause complications at the latter stages of a project that result in issues arising, which can prove costly and time consuming (Motawa 2012). It is therefore essential that any potential changes be identified as soon as possible, typically, within the design phase, this occurs, in order to reduce the impact of those changes and lessen the potential of costly delays (Motawa 2012; Erdogan et al. 2005). Therefore, *how* to approach change is as much an issue as being *open* to change, but it is imperative that change be proactive (Ibbs & Chen 2015).

Implementation of change(s) within the construction sector must be managed to lessen potential negative consequences, as well as assure project profitability and quality (Erdogan et al. 2005). It is within the implementation of changes that the greatest impact can occur due principally in the way they are managed. Management of the implementation of change management within construction projects typically requires a broader approach, in that in many instances the changes occur at both the project and organisational levels (Erdogan et al. 2005). Changes can occur for many reasons beyond project design, such as, for changes to engineering standards, regulatory or safety changes, or legal requirements. These changes can necessitate the project team to adjust work output, as these factors will necessitate in changes to schedules and tasks. Changes invariably affect time scales and project costs as the implementation to deliver the project undergoes additional pressures to attempt to deliver on time (Erdogan et al. 2005). This latter statement is significant, as the realisation of changes can cause time overruns that can result in penalties (Chester & Hendrickson 2005). Time overruns and escalating costs due to changes has been considered extensively in research (Finke 1998, Thomas 2000; Akpan & Igwe 2001; Chang 2002; Guo 2002). Consequently, certain types of changes are seen as inevitable in construction projects, such as, changes to scope (rework), which are seen as the most common and invariably affects design post design implementation (Chester & Hendrickson 2005). Decision making centred on evaluating changes must be conducted typically a Critical Path Method (CPM) analysis, whereby the benefits are weighed over costs prior to implementation of the changes (Chester & Hendrickson 2005).

The second stage of implementation is to guarantee organisational alignment with the change managers and the staff. It is essential for management and staff to be psychologically prepared for the change process. It is particularly important to acknowledge that some people in the organisation will resist the changes for a variety of reasons, and should not be ignored (Lines 2004). The readiness of the organisation, department or section for change can be assessed through workshops, formal questionnaires and some tasks (Kotter & Cohen, 2002). Potentially change should only commence when the organisation has been satisfactorily prepared.

Just as Chester and Hendrickson (2005) asserted that rework is the most common type of change, Nahod (2012) asserted that primarily those changes are a consequence of investor requirements. Specifically, investors demand higher specifications from those identified during the planning stage

that must be accommodated in the execution of the project (Nahod 2012). These changes have a negative impact upon the execution and escalate project expense and can impact on quality as limited funding can result in other aspects changing in the project scope to accommodate the new changes (Nahod 2012). Nahod (2012) contends that the use of CPM has practical limitations and only effective as a tool in decision making where resources and time do not constrain the project. To manage and make effective decisions as to changes it is necessary to elect tools and create a hybrid mechanism for evaluating effectiveness of changes for execution (Nahod 2012).

Bureaucracy is a major obstacle for many projects seeking to execute change (Kotter & Cohen 2002), and the ways in which change is authorised has been studied to determine what actually leads to successful change. Middle management is typically responsible for leading the change process by engaging project partners, who usually have little say about the parameters of the change. The organisation's staffs manipulate the environment to ensure change decisions have the desired outcomes for all the stakeholders. Any organisation that is preparing for a change process must be flexible and able to draw on different personal capacities to ensure success in settling, authorising and executing change processes.

The CH_4 results showed that organisations planning change had guidelines for authorising change processes, which were all reasonably similar. Typically, changes to project plans or scope require senior management sign off; the same is true of changes to contracts and specifications (Hill 2013). Having strict control ensures that all stakeholders are informed and by having a proactive *change management* process that is included in the project management methods, the changes and their impact can be monitored (Hill 2013). Analysis of the data generated during the current research indicated that project change should only be authorised when organisational leaders think the staff is ready, as indicated through interactions during staff training and induction (Kotter & Cohen 2002).

By the time the change process has been started, it can be expected that some background review, such as a system audit report, will have been undertaken (Kotter & Cohen 2002), which has critically evaluated operations, measured the scope of the change needed, and conducted a benefit analysis of the process. By this stage, all the potential project risks should have been evaluated, responsible people identified, implementers briefed and goals set in agreement with all other partners (Kotter 1995). Only then can the planned change be authorised.

Authorising change means management have a greater chance of harnessing good behaviours, motivating attitudes and getting support from the organisation as a whole (Kotter & Cohen 2002). This implies that project managers who fail to authorise their respective project changes could experience poor execution, workmanship, poor staff retention and quality attributes. Again, this emphasises the need for skilled staff and training (Al-Kharashi & Skitmore 2009).

The current research indicated that projects must be properly authorised because so many resources are at stake that would be wasted if approaches to projects were haphazard. Furthermore, organisations need contingency plans because some events can warrant emergency changes that could affect processes and critical business functions. Finally, it was determined that specific projects have special change needs that are not applicable in other cases generically. This implies that the process of change authorisations should refer to industry experience whenever relevant and applicable after consideration of the agility and the competitiveness.

Susceptibility to change

It was observed that there are specific areas of organisations that are susceptible to change, but it is only justified if management has a clear meaning and vision, strategies, operational structures, work instructions and procedures in place and there are prompts for change, such as new technologies. It is expected that change leaders will be able to justify their reasons for pushing for change (Carter, Ulrich & Goldsmith 2005).

Of the many reasons for change in an organisation, the movement of staff is one of the most common (Kotter & Cohen 2002). Staff may be promoted or leave and new staff may come into the company. Staff movement always involves change of some sort and a period of transition. New staff can redefine the project destiny, introduce new management strategies and the old project processes could change to align with the new staff skills. Conversely, of course, new staff entering a project team can be quite disruptive. Although new skills could be introduced, skills might also be lost. Furthermore, even skilled staff with plenty to contribute, disrupt the prevailing structures, and the senior management must realign all reporting structures to ensure that the organisation's operations are not adversely affected (Kotter & Cohen 2002). In addition, incoming employees, especially those from wholly different organisations, may disrupt the dominant organisational culture.

Another area where an organisation is susceptible to change is in response to competitive forces. Whenever any business segment becomes competitive, it can lead to organisation change for the sake of sustainability. The organisation has choices of either matching their fiercest competitors or changing tack beyond the rest (Kudray & Kleiner 1997).

Overall, the current study found that all project change processes must have a specific vision that addresses political concerns, economic trends, social pressure and technological advances. Moreover, all project changes must address the intended policies and structural reviews. If the project change process is well executed, then the entire management and staff will be motivated to finish the process within the shorter timeframe, with minimum resources and optimum quality.

The CH_5 findings also covered project risks that are bound to occur during a change process. A survey by Harvard Business Review in 2006 reported that 76% of project change processes face risks of staff resistance (Carter, Ulrich & Goldsmith 2005). Another 72% of projects have serious communication breakdown risks. About 44% of projects face risks related to lack of staff training and induction to execute the new changes. Furthermore, 36% of projects face the risk of being unable to retain staff during the change period. Finally, the survey found that 32% of projects face the risk of exceeding budgetary allocations (Carter, Ulrich & Goldsmith 2005).

From the collective evidence of risks that projects face during the change process, it can be seen that effective management can resolve some issues. First, on the evaluated risks of staff resistance, project managers can establish cordial relationships with the employees and breakdown the changes and implications in a manner that will inspire confidence and buy-in at an individual level. Additionally, the project managers should have an open door policy for receiving staff feedback during the change process, including addressing specific concerns in a transparent working environment. Second, on the evaluated risks of communication breakdown, project managers must institute a system where vertical and horizontal channels share information about the planned and ongoing change process. Such a policy would further the organisation's mission of transparency commitment to providing information to all the employees.

Third, on the evaluated risk of employee turnover, project managers must communicate with the groups, teams and individuals about the change objectives so that they own the process and feel secure. Additionally, organisations need to engage coaches and mentors to devolve the change

process without causing anxiety among the employees. The goal of this strategy is to enrich the staff's knowledge about the change processes and increase retention in the respective organisations.

6.2 Hypotheses and structural equation modelling (SEM)

In the transformation of our PMPA to SEM, it was appreciated that the EFQM was developed to close gaps in project performances, as EFQM is useful for incorporating TQM into projects (van Der Wiete, Dale & Williams 1997). Substantial work on PM models and performances has been conducted by Maylor (2001) in order to integrate all the different models. In the current study, a model PMPAC by Din, Abd-Hamid and Bryde (2011), which was taken from Bryde (2003a), was adopted. This model was integrated with EFQM with some additional modifications, such as financial management and partnerships and resources utilisation. Consequently, the PMPAC model discussed in this study had the same attributes whose latent variable correlations were determined by SEM.

The univariate analysis of the SEM latent factors established that all but two variables $L_4 = 0.375$ and $L_5 = 0.077$ had weak loading factors below the significant alpha coefficient $\alpha = 0.5$ among the Saudi organisations. Similarly, $L_4 = 0.401$ for the international organisations did not meet the test of significance for the alpha coefficient at $\alpha = 0.05$. First, the finding of the hypothesis L_4 – *The absence of one feature of a project culture will be covered by the existence of another feature* is consistently unsupported by the outcomes from the Saudi and international organisations. Nevertheless, the hypothesis L_5 – *the project environment hindered the development of a project culture* is partially supported by the international organisation responses while the Saudi organisation responses are unsupported. All the other hypotheses were uniformly supported by the loading factors being above the alpha co-efficient of 0.5.

Second, among all the loading factors for the data supplied in the Saudi organisation responses, the strongest was for $S_2 = 0.915$ – *There was a formal process for evaluating the Project Management staff,*' while the weakest was for $L_4 = 0.375$– *The absence of one feature of a project culture will be covered by the existence of another feature*. Among the responses from the international organisations, the strongest loading factor was $KPI_1 = 0.886$ – *The method to manage the important KPIs was developed in the organisation*, while the weakest was $L_4 = 0.401$– *The absence of one feature of a project culture will be covered by the existence of another feature.*

The loading factor data indicate that for both the Saudi and international organisations there are missing project factors that have a cultural orientation. Additionally, the univariate analysis of the loading factor data indicates that Saudi organisations have the better project management practices at the level of formal staff processes, while the international organisations have the better practices in terms of KPI development. (These findings are as shown in Table 5.5).

On the multiple variables modelling, comparison of the loading factor results from Saudi Arabia with the outcomes by Qureshi, Warraich and Hijazi (2008) that used the same PMPA model as Bryde (2003a).

In the comparison of the correlation matrix between the Saudi and international organisations (refer to original Tables 5.5.3 and 5.5.4), it was found that the alpha of significance was generally higher in the later cases. This outcome implies that the international organisations have better project management practices than the Saudi organisations. In addition, concerning path modelling, the strongest link among the Saudi organisation correlated variables was H_5: *staff → life cycle management* = 0.527, while the lowest was H_5: *staff →life cycle management processes* = 0.054 with p=0.529 being significantly different from zero under the revised model.

Moreover, among the international organisations, the strongest link for the correlation variables was H_6: *policy and strategy → life cycle management processes* = 0.632 with p= 0.054, while the lowest was H_8: *partnerships and resources → financial management practices* = 0.201, with p= 0.056 being significantly different from zero under the revised model. Once again the international organisations yielded stronger modelling effects when variables were compared factor by factor than was the case for the Saudi organisations where the path coefficient was significantly different from zero at $\alpha = .05$.

The SEM indicated the path that project management *leadership* should execute specific roles and responsibilities in terms of *policy and strategy* (H_2 - β= 0.509 and β =0.613 at α = 0.05) for the Saudi and international projects respectively. The SEM path illustrated that PM *leadership* is successful in creating awareness about the purpose of the project among the internal and external stakeholders so that *change management* can proceed expeditiously (H_4 - β= 0.521 and β =0.243 at α = 0.05 respectively). The SEM consolidated project *leadership* support for different staff cadres

while recognising the organisational culture as a force that determines success in any project (H_1 - β= 0.522 and β = 0.533 at α = 0.05) respectively.

The SEM path established the fact that project management staff are effective in project planning initiatives for both Saudi and international projects. In order to yield any higher performance from staffs, the organisation must offer some reward and appraisal schemes, which identify their employee's strengths and the need for training and development. Therefore, the SEM path proved that effective human resource management is the backbone of sustaining the project life cycle (H_5 - β= 0.527 and β =0.230 at α = 0.05 respectively).

During the SEM path review of the management strategy and policy, it was established that Saudi and international organisations have elaborate plans and sequences of activities, which are connected to the entire project life cycle (H_6 - β= 0.228 and β =0.632 at α = 0.05 respectively). However, it was found that this was only possible when the project management strategy was accepted by the stakeholders, including partners. The plans were designed for different project phases and were executed using tactics that ensured prudential financial management (H_7 - β= 0.228 and β =0.352 at α = 0.05 respectively). The current research found that project management policies that support sound financial management are available among Saudi and international organisations under controlled or delegated frameworks.

From the SEM path and the analysis of the project management partnerships and resources controlled by the Saudi and international organisation, it was clear that a balance was required between clients, suppliers, industry peers and other support partners that could only be achieved by cooperation. Thus, a sound *partnerships and resource* management structure will strengthen *financial management practices* (H_8 - β= 0.0.054 and β =0.201 at α = 0.05 respectively).

The SEM path for the project life cycle (PLC) operations among Saudi and international organisations revealed its usefulness from the beginning to the closure of the performance phases. It was found that PLC is entrenched in the upstream and downstream project operations for delivering various key performance indicators. (H_{10} - β= 0.437 and β =0.393 at α = 0.05 respectively). It was established that for both Saudi and international organisations, articulating the narrative of the PLC must be clear and comprehensive in order to engage customers and partners and achieve better performances.

KPIs are an integral part of any PMPA, and these were reviewed and it was shown that they establish a working discipline and help both project managers and employees to understand whether specific activities are on course. It was established further that KPIs define methods that both project managers and employees in the Saudi and international organisations must follow to achieve desired goals. However, the analysis did not have a SEM path model that started with KPIs since it was found to be most suitable as a secondary component of project management.

The importance of *change management* in the SEM path for Saudi and international project management was recognised, and it was ascertained that its greatest impact was on financial performances (H_9 - β= 0.510 and β =0.306 at α = 0.05 respectively). This implies that any project that has adequate planning and execution of the change process will incur lower transitional costs than others not so well prepared. Similarly, successful *change management* is closely related to project *leadership* style, and must be as consultative as possible to ensure maximum cooperation.

Finally, the SEM path reviewed the project financial management practices among the Saudi and international organisations and their possible correlation with other variables. The researcher found the strongest association between *financial management* and KPIs (H_{11} - β= 0.364 and β =0.455 at α = 0.05 respectively). This implies that the performance of every project phase with specified KPIs will eventually be measureable from a financial perspective. Therefore, it is incumbent upon the respective project managers to define the KPIs as appropriately as possible in order to capture the financial implications of the projects.

6.3 The objectives, gaps and the literature review

The goal of the research was to understand how project management performance and the concepts associated with it, often appearing as criteria to measure PMP, could be used to develop effective solutions for the management of projects in Saudi Arabia. The research gathered data about organisations managing projects in Saudi Arabia in terms of *leadership*, *lifecycle process, staff, partnerships and resources, policy and strategy, financial performance, change management and key performance indicators* for analysis. The results proposed a framework solution for implementation and management of future projects in the region. The information from this study also helped to comprehend the significance of *change management* in both public and private organisations across multiple industry sectors.

6.3.1 The objectives

Two major objectives of the research were:

- to better understand how project management performance criteria can be used to develop sustainable solutions for the development of projects in Saudi Arabia, the key criteria being *leadership*, *lifecycle process, staff, partnerships and resources, policy and strategy, financial, key performance indicators*
- to assess projects in Saudi Arabia in terms of *change management,* which were added to the PMPA model for the purposes of the research study.

The use of project performance criteria

The first objective of the research was to increase understanding of how project management performance criteria could be used to develop a sustainable solution for the development and management of projects in Saudi Arabia, and to assess projects in Saudi Arabia. In this study, a PMP model, was used which evolved from the EFQM approach. It was composed of concepts or criteria, such as *leadership, lifecycle, staff, partnerships and resources, policy and strategy,* and *key performance indicators*. This model was systematically improved during the study period to cover gaps that arose when practical applications were considered in many projects, including finance and *change management*. Data indicated that *leadership* was the most important variable for staff cohesion, policy formulation, communication and overall project management. This result implies that PMP is directly determined by PM initiatives and indirectly by *leadership*, team, policy, strategy and communication.

The development of the PMP model was the foundation of the structured SEM, whose adoption was justified in this study since individual variables are immeasurable in isolation as KPIs to garner data with which we can advise project managers appropriately. Accordingly, the researcher concluded that the linkage between the different sources of literature and the CSF provides the PMP model with the necessary evaluation background.

Concerning *leadership*, it was concluded that those projects that perform well could be defined by their clear objectives throughout the life of the project. On the other hand, competent project leaders execute plans relevant to the objectives at every stage of the project through the employment of the appropriate resources. The role of the project leader is to call on their experience, so that all phases can proceed without issue.

Additionally, *leadership* is critical in project management for allocating duties and responsibilities across all levels. Strong project *leadership* is looked upon for the stability and sustainability of the project. It is important for the organisation's leaders to adopt a style that ensures the deliverables of the KPIs and to delegate authority from the top to subordinates or clients.

Data related to the criteria of *strategy* demonstrated the need for regular project reviews so that goals are continuously aligned to resource utilisation. It was further concluded that strategy is essential for helping project managers understand and track their resource needs to allow for appropriate deployment of resources over the lifetime of the project. Project managers can employ a strategy of regular meetings to determine project progress and address any emerging challenges and hurdles. In such strategies and engagements, the project managers will be able to provide feedback to teams, groups and individuals about the next steps. Additionally, these strategies are useful for clarifying any specific issues in the project phases that warrant urgent attention. Issues of project quality are best addressed by strategic planning to ensure conformance to stipulated standards.

It was concluded that the role of teams in project management is to integrate staff capacities for application toward a common goal. Additionally, the role of teams is to ensure that all the project staff and other stakeholders take responsibility for their actions and the delivery of their respective KPIs. Teams are useful in project management for the speedy resolution of conflicts and the development of synergy with a common purpose. They are useful for sharing and learning experiences that are vital for project execution; and good teamwork is essential for creating trust among all the project members so that communication can flow freely. Teams are good for conveying the project mission and vision, and projects whose staff work in teams tend to be more cohesive than their counterparts.

The communication criterion of project management includes relaying information to the project participants in a timely manner and according to the agreed protocols. This observation confirms that communication is a pillar of project success, especially when accurate messages reach the target groups. Project staff requires systematic and timely communication about the progress and next steps in the project in order to avoid gaps and errors, which has a negative impact on the KPIs.

Moreover, the communication approach is very important to avoid distortions, which have implications for project success.

From the study of the role of project processes, it was determined that each process must be suitable in form and procedure. Accordingly, any change process must have reflective preparation and implementation stages in order to guarantee success. The frequency of change processes must be rationalised to ensure fewer disruptions throughout every phase of the project, and reduce negative impacts on the clients. These observations imply that all reviews for the clients with regard to project performance must be addressed in a timely fashion.

Whenever there are new project processes, a systematic approach to implementation is needed to minimise the risk of errors that could have cost, timing or quality implications. Additionally, process criteria encompass the degree to which a project is to be evaluated, and what control measures are to be put in place. This calls for sound management methods from planning to implementation under a verifiable quality system.

Assessing projects in the context of change management

The second objective was how *change* management influences project management performance outcomes, for which a SEM analysis enriched by the theoretical background and statistical confirmation of the causality of the model, was undertaken. After an initial evaluation of other possible applicable models in PM, it was concluded that most *change management* processes focus on quality aspects to redefine the modern day PMPA. It was further established that the EFQM model was one of the earliest approaches employed to support *change management* because of the linkages among the PM phases and variables. The conclusion reached was supported by the works of Zulu (2007), Bryde (2003a) and Westerveld (2003), with each justifying their fitness of good for the model to determine PMP outcomes.

It was concluded that the link between the SEM and the PMPQ model was relatively strong (Zulu & Brown 2003); and that all project managers should pay sufficient attention to each variable due to the findings of their statistical loading significance. The outcomes of the SEM evaluations of the Bryde (2003a) model in the context of the study in Saudi Arabia established that the model in the current research was reliable and valid and fit for the PMP purposes. Nevertheless, the test of the significance revealed that some variables deviated from the goodness of fit standards, hence, must

be reviewed in future studies. The SEM model elaborated the link between PMP *leadership*, team, communication, policy and strategy effectively. Therefore, the success of change process of Saudi government owned and private sector projects anchors on these findings.

The outcomes in the SEM study are useful for guiding change processes in construction projects, where most previous studies have been focused. It is acknowledged that the outcomes of the SEM study are replicable in other non-construction sectors where causal relationships are manifested. Consequently, this study's results have implications that PMPQ and SEM are the future of successful project implementation because their factor correlations can inform the project leaders on the best way forward.

The gaps

The primary intent of the research was to close gaps in the knowledge of project management performance in Saudi Arabia by broadening the theoretical and practical research that has previously been undertaken. It can be argued that the current research produced new information in three different but related areas. First, it extended the PMPAC model to the PMPACC and thereby expanded the variables under consideration within the model framework by adding a new variable – *change management.* Second, it considered multiple industry sectors. Third, it broadened the scope of the research by considering both public and private sectors, providing generalizable observations of the project management profession in the Kingdom of Saudi Arabia.

In investigating these three areas of study, the current research addressed two specific gaps.

- By extending the model, it increased the holistic nature of the model and furthered the understanding of the relationships of variables within the PMPACC framework.
- It identified those variables having the greatest impact on project management performance and project success within Saudi Arabia.

Extending the PMPAC model

The research reported in this thesis investigated an adaptation of the Din, Abd-Hamid and Bryde (2011) PMPAC model through the addition of *change management*. The study evaluated this independent variable and its effect on and relationship to the variables in the PMPAC model. Din, Abd-Hamid and Bryde (2011) had applied the model within the context of only the construction sector, which this study was not bound by, as it considered all industry sectors. Din, Abd-Hamid

and Bryde (2011, p. 1044) had also noted that the model was limited by the fact that it was constrained 'in dealing with uncertainty in the external environment, such as price fluctuations.'

Change management as a variable assisted the application of financial management practices in order to address such issues. However, the Din, Abd-Hamid and Bryde (2011) study was conducted in Malaysia and was not necessarily reflective of the nuances of both the organisational and market conditions that affect project management in Saudi Arabia.

It can be argued that the PMPAC model extended the original Bryde (2003a) model to provide a framework that now looked at the construction sector, but with *financial management practices,* it could be adopted across a broader spectrum, such as employed in this study. Then, by adding another independent variable (*change management*), the model would address Din, Abd-Hamid and Bryde (2011) concerns and similarly look to delve further than the Rehman, Usmani and Al-Ahmari (2012) study that only used the Bryde (2003a) model and also only looked at industrial organisations.

The most recent study of Mir and Pinnington (2014) was conducted in the UAE using the PMPA model of Bryde (2003a) that has been previously validated by Qureshi, Warraich and Hijazi (2008) and Din, Abd-Hamid & Bryde (2011). In fact, Qureshi, Warraich and Hijazi (2008) specifically suggest that empirical research be undertaken using the PMPA model to determine the correlation of the variables, to evaluate their effect on project performance. Therefore, the opportunity to extend the use of the PMPAC model, given the limited research conducted using this framework, and the need to expand its variables, furthered the theoretical knowledge base of PMPA in general. By considering the research across both public and private sectors, something that Ali (2010) had suggested, the current research provided insight into any similarities and non-similarities across industry sectors in project management performance.

Up to the time of the current research, the PMPAC model had not been employed in research in the Kingdom of Saudi Arabia and its use extended the knowledge of research conducted more recently, which has been primarily in the construction sector by Rehman, Usmani and Al-Ahmari (2012) and Ali, Al-Sulaihi and Al-Gahtani (2013).

Identifying key variables

Extending the model provided insight into the importance of pursuing *change management* as a corrective measure in the project management cycle. The value of *change management* was

evident in the joint high mean score. Within the Saudi-based organisations, this corresponded to the relationship between *change management* and *financial management practices*, whereby, their correlation was only second to *leadership* and *staff*. This is significant in that it reveals that *change management* was responsible for levels of financial management practice. This is significant in that Din, Abd-Hamid and Bryde (2011) had stated that the performance enablers were linked to *financial management practices*. The research reported here indicates that, in fact, *change management* is a performance enabler over finance. It should be noted, however, that in terms of the international organisations *policy and strategy* was the performance enabler more typically associated with Din, Abd-Hamid and Bryde (2011) over *financial management practices*.

Without question, the research indicated that staffing was critical to both Saudi and international organisations' success, and central to project management performance, affirming the findings of Bryde (2003a), Qureshi, Warraich and Hijazi (2008), and Mir and Pinnington (2014). In both groups, staffing was highly correlated with *leadership*, and the need for staff development was deemed critical for project success, which supports the findings of Mir and Pinnington (2014) who found motivation was essential since motivated staff were seen as central in creating a team atmosphere through which project success could be achieved.

Expanding the scope of the investigations

As to the final gap, Mir and Pinnington (2014) asserted that:

> *The value of Project Management is not so much in achieving Project Efficiency in individual projects, rather it lies in its overall degree of success, which encompasses customer satisfaction, business success of the organisation and achievement of long-term benefits. (p.215)*

The significant point that Mir and Pinnington (2014) make is also one that this research considered within the investigation. Given that, organisational and business success is highly correlated to business strategy as also stated by Oakland (2000) the importance of project success(s) can directly contribute to the long-term strategic success of that organisation. This correlation requires understanding those factors that influence project success to understand how they influence the establishment of corporate strategy. Such factors as how resources are deployed and there functionality in creating a competitive advantage can therefore not only affect project outcomes but similarly influence long-term organisational success and influence how future corporate strategy is developed.

Thus, it is imperative to understand the value of human resources and their roles in projects within an organisation. Similarly, the level of training and development provided to staff will ultimately add value to the organisation, and increase the likelihood of project success, thereby improving business operations and justifying the chosen strategy.

The current research found that for both the Saudi and the international organisations, the quality of staff was a primary concern, but that quality was deficient. It follows that those strategies undertaken to achieve project success will likely fail due to gaps in the workforce skill sets. This has proven to be the case with a number of project failures. This leads to two conclusions. First, that corrective action needs to be taken to address the shortage of skilled project management staff. Second, continuing to undertake projects with a strategy that is deficient in these resources will ultimately continue to realise failure, and not provide long-term value.

6.4 Theoretical and practical implications

In this section, there is a discussion concerning the relevance of the study findings and what practical and theoretical value they provide to project management. The section is therefore divided into two subsections, one focused on the implications of the practical value and the other on the theoretical values achieved from this study.

6.4.1 Theoretical implications

The research linked the concept of project management performance with the RBV theory and thereby showed the value of strategic thinking and resource utilisation in project management and furthermore, how it equates to project success and in supporting business strategy.

By determining the theoretical value and understanding the research study findings, the implications drawn can be applied to future research studies. Two main considerations are discussed with regard to the implications of the study:

- measuring the RBV
- validating the RBV theory

Theoretical implication: measuring the RBV

RBV is a highly valued theory in strategic management. The theory holds that through the correct choice and utilisation of resources organisations can generate a competitive advantage over a competitor. Specifically, it states that intangible resources must have certain qualities with which

they can affect organisational performance. Organisations choose and use resources as part of daily business activities to generate profit, whereby they aim to increase their performance. The selection and utilisation of how they use those resources is what determines the level of performance and whether they achieve a competitive advantage over their competitors. Given the complexities of business, the theoretical value of RBV is constrained by variables not under the organisation's control since competitor firms also contest for those resources and deploy them to gain a similar competitive advantage.

Each organisation employs a different approach to organisational activities, depending upon their respective organisational goals and values. Differences can include the markets in which they operate the level of investment in technology, and the number of market competitors that they face. In project management, the resources used are those specific to the project, which represent a subsection of the total resources. Only a specified number of staff will actively be involved in an organisation, and specific resources attained for the project may be purchased or acquired temporarily.

This study looked into how project management does and could affect the use of those resources within the context of projects already undertaken, specifically by using a conceptual model that considered the correlations of specifically chosen variables and how they affected the use of the resources. It can be assumed that all the variables have essentially zero effect until measured or assessed, as was the case in this study. It was found that in terms of successful projects, all staff resources had the greatest influence and the highest value. This finding alone varies from other studies where KPIs or *leadership* has been nominated as the resources of greatest value.

Theoretical implication: Validating the RBV theory

Validating the RBV is the second theoretical implication. Since all of the organisation's resources are under consideration, when an organisation wishes to utilise a framework model such as PMPAC or any variation, choices can become confused, particularly in knowing what effects particular variables will deliver. When the variable is a tangible resource or if it is finite, the firm's understanding of what the resource can accomplish is straightforward. However, when an organisation is focussed on intangible resources, like ability or *leadership* style, where there is significant variation between firms, the outcome will not be consistent across firms.

Therefore, validating this theory is problematic as the choice of resources can instrumentally affect the project lifecycle in ways not easy to anticipate or to amend if required. Galbreath (2005) confirmed that the choice of resources might not be of relevance.

This research study undertook to expand previous studies by adding *change management*, as a new variable to the model. Analysis of the model suggests that the manner in which resources are responsive (proactive or reactive) to change is instrumental in the process of project management and to those activities used in projects. The outcome of the research demonstrated that managing change is critical to the selection of resources because *change management* is inherently an activity that takes into account the unexpected and responds to it in ways that support project goals and objectives while leading the staff through critical milestones from the 'now' to the future.

6.4.2 Practical implications

The practical implications for project management performance that come out of this study can be divided into two groups:

- implications for project management practices
- financial practices

Implications for project management practices

The Kingdom of Saudi Arabia faces many construction project challenges, but there are the following broad types, 'Engineering; Human Resource; Management; Political, Social and Legal; Financial and Economic and Sustainability and Environment' (Othman 2013, p. 733).

Engineering challenges in Saudi Arabian projects

Research shows that various construction projects face engineering challenges when the project size is large, with a scope that extends beyond the capacity of the implementers (Sanderson 2012; Sturup 2009). In these circumstances, engineering designs could face additional capital requirements since the project may extend for a longer period than initially planned (Frick 2006; Bruzelius, Flyvbjerg & Rothengatter 2002). Moreover, if the project is in a remote place, additional engineering challenges arise because of the need to move machinery, which cannot manoeuvre or operate with the desired efficiency and safety (Flyvbjerg, Bruzelius & Rothengatter 2003; Haynes 2002).

There are an abundance of studies on construction project engineering challenges that have identified specific challenges to managing them due there complexity (Haynes 2002; Flyvbjerg, Bruzelius & Rothengatter 2003; Al-Kharashi & Skitmore 2009; Ali, Al-Sulaihi & Al-Ghatani 2013). Complex designs that demand appropriate skills during the planning and execution phases, including the logistical preparations (Sturup 2009; Frick 2006), and multi-faceted engineering teams are required if the desired project deliverables are to be achieved. Some of these engineering capacities must be drawn from different organisations, which adds another layer of problems to be dealt with by project management (Flyvbjerg, Bruzelius & Rothengatter 2003).

Construction of large or complex projects may take years, even without having time extended by a variety of complications, such as resource shortages or a lack of appropriately skilled personnel (Al-Ojaimi 1989; Al-Ghafly's 1995; Al-Kharashi & Skitmore 2009). Overruns pose unique challenges, including additional planning, the need for extended site control, and the other commitments of the engineers and professionals who might agree to work on the project for a certain amount of time and no longer (Sturup 2009).

Depending on the country's national cultures, the commitment to the project plans could depend on their long-term orientation (Kerzner 2013). Moreover, some construction projects require adherence to industry rules and regulations as stipulated by engineering oversight bodies (Sturup 2009). It is common to find some construction projects failing to pass routine assessment by the accredited engineering bodies, leading to demands for remediation or orders for the total demolition. These outcomes have cost implications, and are among the reasons that issues of quality standards for construction projects should be resolved at the time of forward planning (Kerzner 2013).

Perhaps the most common challenge in the construction industry is the issue of engineering capacity (Sturup 2009). Since many project contracts are drafted after the bidding process, it is often difficult to confirm before the project agreement is in place whether the firm actually has the scale, engineering capacity and experience to accomplish new projects (Frick 2006). In addition, the dynamics in the construction industry present various engineering challenges because some firms are unable to perform within time constraints (Flyvbjerg, Bruzelius & Rothengatter 2003). These realities of the contracting and performance of firms are issues of both the commissioning body and the firms themselves, and are serious issues in the construction industry.

In Saudi Arabia, whether the projects are being run by national or international companies, the current research found that the engineering challenges tended to fall into two categories – design and technical. Engineering design challenges manifested themselves in response to a lack of adequate knowledge from local labour, hence the influx of international project managers and expatriates in the construction industry. Another common engineering design challenge was partnership misunderstanding of the project scope, leading to partial accomplishment of the performance measures. Moreover, engineering design challenges were noted in the inconsistent decision processes, where expert advice was commonly overlooked while other project partners assumed roles beyond their mandate, and sometimes their capacity.

Other issues at the design stage were shortages of the required materials of the required specification, which frequently led to substitution and posed quality of work challenges or led to escalating costs if the requisite materials had to be imported. Decisions about the type of construction material sometimes prolong and affect the project schedule, especially where technology has to be adjusted due to lack of original specifications.

Additionally, mismanagement of engineering specifications was apparent in many projects because staff skill levels, from the engineers down, were not sufficient to deal with the tasks, which resulted in conflicts between the contractor and the customers. Moreover, language posed some engineering challenges because local employees found it difficult to interpret the international standards. In these circumstances, standards were often compromised, more by accident than any malicious intent, because staff simply did not appreciate the formulaic benchmarks common to construction projects. However, some construction project technologists in Saudi Arabia tend to overlook specifications, even when they have consultative opportunities with their partners, and this poor decision making leads to poor quality and cost management. Furthermore, some engineering design challenges arise because the contractors can alter project specifications at any phase of the lifecycle for various reasons.

Data analysed for the current research therefore indicated that engineering technical challenges arise from insufficient professional guidance or mentorship since high skill levels are required to adhere to the project technical specifications. Furthermore, there is little understood about the Saudi population's capacity to accomplish certain complex projects, given the lack of Saudi's historical

experience with complex engineering and science education. Consequently, many innovative projects are often delayed while the right contractors are sought or completion is stalled when an inefficient or inexperienced partner cannot complete their tasks appropriately. Where international contractors have been recruited in to fill the gaps, they also face significant work process challenges often due to their inexperience with Saudi culture or difficulties with communication. Moreover, it was found that many Saudi construction projects have poor engineering specifications and work instructions from the beginning, which evolve into technical errors and issues once the project is commissioned. Engineering technology challenges in Saudi Arabia extend further to poor machinery and infrastructure quality, yet these are essential for supporting the project phases to completion.

A clear conclusion from the research was that if the construction engineers could have strategic planning and sound *leadership*, then the rate of project failures in Saudi Arabia would drop significantly. Moreover, if engineering technologists in Saudi Arabia held regular workshops to update one another on industry trends and developments, knowledge levels would improve, this could translate to better practices. Finally, when standards are altered during the project life cycle, the issue should be discussed and properly documented by the various Saudi Arabian project partners for due diligence purposes.

Human resource challenges in Saudi Arabian projects

According to various studies, challenges related to human resources in construction projects come from both the lack of appropriate skills and the lack of available numbers (Haynes 2002; Keegan & Den Hartog 2004). Human resource planning is often poor; leading to extra costs by the time a project is nearing completion (Keegan & Den Hartog 2004; Bruzelius, Flyvbjerg & Rothengatter, 2002). Appropriate labour is missing and the hiring from beyond the national borders presents special problems with which the HR system is not organised to manage (Jia et al. 2011; Little 2011). Since project managers have to settle with what/who is available, quality problems inevitably arise (Little 2011).

The need for trained labour has seen a steady influx of foreign labour into Saudi Arabia in recent decades to fill this human resource gap. Nevertheless, the identification of the correctly qualified persons has not been easy or consistent, resulting in tasks being assigned wrongly among the geographically dispersed contracts. Consequently, some projects stall or fail. Problems with staff

are further exacerbated by the lack of qualified staff willing to take up jobs at construction sites, leaving project managers to resort to other less qualified and short term contract workers whose retention is equally a challenge.

It has been established that human resource management in Saudi Arabian projects is extremely fluid, coupled with skills gaps and every organisation competing to hire and improve (Alshanbri et al. 2015). Construction industry training for the Saudi labour markets has been found wanting for years, and now some construction organisations in the country have turned to internal training to close the skills and availability gaps, but the market is yet to become saturated with these labour numbers (Al-Harthi, Baegis & Ingirigie 2015).

The issue of inexperienced staff therefore continues to weigh on construction project management in Saudi Arabia. Attempts to fill the gaps with poorly trained or placed employees have only introduced expensive inefficiencies and errors into the field of construction. The Saudi government's policy of Saudization has not had a conspicuous influence on labour skills development or balanced the influx of foreign labour into the country and into the construction industry in particular. This can be attributed to increased demand for labour as driven by construction projects in the region, which has created a demand for more foreign labour since there remains a shortage of Saudi national suitably trained to undertake the relevant roles (Alsheikh 2015). Thus, it is believed that a combination of government and private sector approach in dealing with this issue should be encouraged to improve project performances.

Management challenges in Saudi Arabian projects

Studies have shown that construction projects often face management challenges, which have ripple effects on the quality, cost, timeliness and other performance attributes. However, these challenges differ depending on the project ownership and whether the project sponsorship is privately or publically financed (Kardes et al. 2013). Furthermore, if construction projects have international ownership, the management faces challenges in fitting in with the local cultures, where the majority of the workforce will be sourced (Sanderson 2012).

In addition, project managers have to contend with management interferences that are politically instigated, and forced to deviate from the original project path or specifications (Ruuska et al. 2009). The problem of the language of communication is another common management challenge

when the project is internationally owned because the foreigners and the locals must understand each party on a daily basis (Shore & Cross 2005). Considering that the same construction firms could have more than one project running at the same time, it is a challenge to balance between competing objectives (Haynes 2002).

The compatibility of the management structure with the project at hand is a rising concern that requires forward planning; otherwise, undesired outcomes can be registered (Kerzner 2013). Whereas, most project owners have a generic organisational structure for most of their activities, some have a very rigid matrix and this poses a challenge to the entire project future (Stoddart-Stones 1988). To overcome this requires establishing a flexible organisational structure, where labour can multi-task and shift from according to the project requirements to save the cost of hiring specialised labour from outside of the organisation (Haynes 2002).

Another common management challenge is the lack of experience to tackle the scope of the projects (Keegan 2004). Project quality may be compromised if the specifications are complex (Haynes 2002). In order to overcome such management challenges, it is possible that organisations need to restructure with the possibility of collaborating with other firms that have experience in handling the project at hand (Keegan 2004). Alternatively, the project can be restructured at phase levels to accommodate the complex specifications, which threaten to jeopardise the subsequent lifecycle (Kerzner 2013).

A great deal of evidence indicates that perhaps construction project management challenges are the biggest drawbacks for investors in Saudi Arabia. In the early phases, some projects face misunderstandings about specifications, and the managers adopt an average approach and hope that the technical specifications will be reconciled during the project life cycle. Furthermore, lacklustre management of the project resources often stretches the final costs and prevents the achievement of objectives.

It was established that various construction projects commence before accomplishing in-depth studies on capacity and requirements (Bagies & Fortune 2006). Therefore, midway through the project lifecycle, there are calls for additional research, the findings of which actually affect the initial management plans. If these initial research tasks were accomplished in a timely fashion, then

the project innovation opportunities could be identified for the benefit of the owners and partners from the beginning, but these sorts of behaviours are missing in PM in Saudi Arabia.

A lack of understanding of the construction regulatory framework in Saudi Arabia is causing concern among project owners, especially when later interventions are needed for modifications and statutory compliance. This implies that proactive management among project managers in Saudi Arabia is not being practised. In the current study, there was confirmation that the bureaucratic practices among the oversight authorities when dealing with the project owners cause a lot of mismanagement, since some technical and design decisions simply cannot be made on time. Additionally, the fact that some projects are able to kick off before authorisation of phases by the inspectorates indicates a tendency for possible corruption.

Since there are different classifications of construction projects, there is a need to identify the right partners before work starts. However, it was established that many projects in Saudi Arabia fail in this task and this later renders management efforts tedious or futile. It is necessary that website information about potential construction project partnerships be updated regularly to enable respective project owners to engage and minimize the wastage of resources. Moreover, such information should be able to assist the project managers to build internal and external capacity and improve their management performance indicators.

A common project management problem facing both Saudi and internationally owned projects was the lack of trained supervisors. In addition, the size of construction projects that have been established in Saudi Arabia demands special skills and qualified personnel going forward to strengthen the internal project management capacity. Furthermore, some construction projects have been relying on outdated rules and regulations that place the management in question in an awkward position in terms of contingency measures on site.

Various construction projects in Saudi Arabia lack forward planning, and internal inefficiencies are a common occurrence. Forward planning would ensure all construction material needs are reconciled to avoid delays once the project phases run short of supplies. The current study considered such weak internal governance structures a potential contributor to project failures. Moreover, most project owners proved slow at exploring innovative opportunities because of the stages of authorisation from internal and external sectors.

Some construction projects in Saudi Arabia have internal management weaknesses occasioned by a lack of motivation and staff development policies. Consequently, the achievement of project goals is sometimes elusive and delays are the symptomatic events attesting to this project management challenge. Furthermore, it was established that various projects have irregular risk analysis engagements, which would ordinarily point out the management weaknesses. In essence, many risk analyses are reactive rather than proactive and this has dire consequences for some projects.

The lack of management professionalism is emerging as a major concern, especially among the international projects. There is growing evidence that some project owners are engaging in unethical behaviours whenever the oversight authorities are not on site. Management of health and safety often collapses, which has an adverse impact on the staff and project surroundings (Al Haadir &Panuwatwanich 2011). However, if the respective project owners engaged experienced and supervisors, such incidences would reduce significantly.

Political, social and legal challenges in Saudi Arabian projects

Research shows that political challenges have a negative impact on many construction projects and could lead to lack of commencement, delay or midway termination, depending on the gravity of the issues contested (Ruuska et al. 2009; Haynes 2002). Among the common political challenges is lack of public involvement and buy-in for the project (Ruuska et al. 2009). Essentially, some construction projects have an impact on the public, whether environmentally, residentially or economically (Ruuska et al. 2009). Hence, the public must accept the benefits of the project before construction begins. Moreover, some projects have social ramifications, which must be recognised in initial risk analyses.

For example, the project may be a cement factory, which is likely to pollute the environment or affect the quality of underground water in the surrounding area (Haynes 2002). Therefore, an initial assessment accompanied with political lobbying which elaborates how the society will benefit economically must be accomplished. Otherwise, the project will run into legal challenges after colossal amounts of capital have been committed (Stoddart-Stones 1988).

Another category of legal challenges that face many construction projects involves the source of labour and the appointments of locals to manage the processes. Whereas, professionalism is often favoured in some mega projects, it is common to find the surrounding communities lobbying for a

community member to be included on the management board to provide a face of the community and proximity to the project owners when articulating issues that affect them directly (Haynes 2002). Hopkinson (2007) added that insufficient political risk analysis and lack of consensus on the location and stakeholders of the project could pose problems further in the project life span.

In the review and comparison of the Saudi owned and internationally managed projects, it was found that bureaucracy prevails; with the latter facing, more burdens during project approval stages. Additionally, it was found in the research that there was some anecdotal evidence that selected government officials are corrupt in the approval of construction projects and this discourages potential investors while denting the political image of Saudi Arabia. Essentially, most of the internationally managed projects are in desperate need of political support to assure timely, cost effective and high quality completion. Some Saudi construction projects are favoured over the internationally managed projects when it comes to government inspections and oversight authority on aspects like health and safety. Furthermore, some of the project authority inspectors are unable to accomplish risk analysis for some complex projects since they cannot perceive the ramifications. This problem, coupled with the tendencies of some international project owners to influence the decision of government authorities at approval stages compounds the political picture of Saudi Arabia's construction industry.

Among the social challenges in Saudi Arabian projects, it was found that many projects commence before finding their intermediary partners, hence, it is common to find stalled construction works while this social issue is being resolved. The consequence is delays in project completion. It was further determined that, especially the internationally managed projects have challenges in identifying and collaborating with the right industry partners since they have goals like cost optimisation. Consequently, some projects commence very late and this impacts the rest of the schedules.

In some projects that employ large numbers of labour in Saudi Arabia, it was observed that there was a lack of adherence to health and safety regulations, including missing displays of safety and hazard signs in the sites (Awad 2013). These lapses have social implications because it affects project staff and poses challenges to the unskilled and already fluid labour market. Moreover, there were conspicuous elements of social divides among the project employees because the site

managers and supervisors favour locals before considering the international expatriates. If the project has huge stakes and teamwork is desired, then such a lack of supervisory tact in Saudi Arabia is bound to be counterproductive. The biggest social challenge observed was that facing the international labour force, which is culture shock at the project sites and in the Kingdom. Many local project managers have gaps in handling cultural issues, as well, and this has ramifications on various performances.

Sustainability and environmental challenges in Saudi Arabian projects

Studies have established that many construction projects have risks, which threaten their sustainability (Carter, Ulrich & Goldsmith 2005; Mattiske 2012; Smith, Merna & Jobling 2014). Thus, some project requirements are predisposed to certain risks during their implementation phase and this requires the contractor to follow the stipulated procedures without any modifications or risk rework or demolition (Ruuska et al. 2009). Moreover, studies have established that some projects face sustainability challenges when the project exceeds their planned economic phases (Jia et al. 2011; Little 2011). In the critical analysis of the Saudi owned and internationally managed projects, it was established that many ventures lack environmental risk analysis or due diligence for unexplained reasons. Moreover, in some instances, historical sites were demolished in order to undertake projects. This sends a message of lack of concern or regard for environmental conservation.

Financial and economic challenges Facing Saudi Arabian projects

Financial challenges are one of the greatest impediments facing construction projects. Depending on the scope of the project, some mega ventures require up to US$1 billion or higher, and raising this type of capital is very difficult for many potential investors (Frick 2006). Additionally, if such projects were to delay in completion, then the cost could escalate beyond the budgets (Flyvbjerg, Bruzelius & Rothengatter 2003). A related view was held by Sturup (2009) who found that some construction project overruns cost as much as £150 million on average. Therefore, getting financial partners for construction projects of such scope can be controversial in some instances because of requirements for collateral (Sturup 2009).

The financial stakes and payment schedules are a common project management challenge since the contractors are often paid after completion of phases as per the agreements. This implies that if a

project is complex, there could be delays in the transition to phases if the contractor does not have sufficient financial reserves. Furthermore, the possibility that the project contractors could require funding to purchase some assets for the task raises more challenges (Sanderson 2012).

In this study, under the section of rework and demolition, there was extensive insight on how many construction projects face financial challenges associated with these activities. The research made it clear that some of these activities deplete the initial budgetary allocations, thus there is need to solicit for additional capital funding, which face time constraints, yet the project schedules are elapsing.

The blame can be placed on the respective project owners for failing to secure enough funding before the project kicks off, including contingency resources to be deployed during emergencies. It was further found that the respective construction project authorities should not be giving the green light for commencement of work if the issue of financial security has not been categorically resolved. Finally, the current financial risk analysis was determined to be insufficient because the project owners often underestimate the consequences attached to poor project performance.

6.5 Research limitations

All research inherently will have undeniable limitations from which future research opportunities can be undertaken, and this research was no exception. The limitation of research is defined by what constrains it, namely the scope of the research undertaken, the data gleaned and findings derived (Fellows & Liu 2008).

Research limitations are noted by specific type:

- Data that is missing along with repetitive answers associated with questions that are related to project management performance.
- The pilot study that employed a pre-test survey permitted the potential for comparative review of results although restrictions did arise.
- The group was limited to public and private organisations operating in Saudi Arabia.

The first research limitation, missing data and repetitive answers is a frequent occurrence as the respondents may forget information or may not have encountered such projects that yielded answers to address the questions. In some instances, individuals may not provide information e.g. financial. In these instances, this poses a challenge to the research study. In this research, there was

missing information regarding organisational project management performance, which was attributed to non-disclosure or the respondents did not have the experience to answer the questions.

The second limitation was linked to the use of a survey questionnaire that had been employed in previous research studies. This provided the researcher an opportunity to make a comparative assessment of the responses from this research study to those already conducted. However, the research study questionnaire was not unique to this study and it may be construed as a research limitation. Additionally, the survey was pre-tested prior to the study commencing so this provided opportunity for analysis and thus could be a limitation.

The final limitation was geographic in nature. The public and private organisations operating in Saudi Arabia that were analysed in this research limited the opportunity to explore additional organisations outside the region.

6.6 Summary

Chapter 6 discussed the amalgamation of the research analysis and findings in Chapter 5 in conjunction with explanations of the individual research questions, interpretations of those findings were presented in discussion with the literature review from Chapter 2 within the context of the research framework. The discussion chapter also brought to light specific research gaps and limitations that were identified. In addition, practical inferences were drawn as well as theoretical ones. The following Chapter 7 will discuss the conclusions of the significant research findings and central issues that relate to potential future research study.

Chapter Seven

CONCLUSIONS AND FUTURE RESEARCH OPPORTUNITIES

Chapter 7 concludes this thesis and presents two parts; firstly, the chapter offers a cumulative synopsis of the results derived from the thesis and secondly, it proposes suggested recommendations for future research studies that could be conducted by researchers in this field.

7.1 Conclusions

The project management sector and the implementation of the associated principles have given rise to a number of serious questions about how effective the sector is, given the significant numbers of projects that fail. In an attempt to understand and stem the failure, over the past decade new innovative modelling has been undertaken to increase project management performance assessment and project success beyond the iron triangle. The study reported in this thesis examined those factors that specifically affect project success by evaluating project management performance through the application of an assessment model. This research built upon previous research in the field, and provided specific understandings of project management performance theory and applications within the specified study context by evaluating relationships between specified variables.

The study used the RBV theory and the PMPAC model as frameworks to guide the research. The RBV theory is grounded in the concept of elucidating how organisations allocate and deploy their resources to achieve a competitive advantage. In this research, RBV represented what can be achieved when resources are carefully considered. The PMPAC model used in this research study was adapted to include a new variable *change management*, which extended the model proposed by Din, Abd-Hamid and Bryde (2011).

Furthermore, while the emphasis has been typically to focus on one industry sector e.g. construction, as was the case with Din, Abd-Hamid and Bryde (2011), the current research considered all industry sectors where projects were completed or ongoing. *Change management* was selected as a variable to test the hypothesis to determine what effects *change management* has on a project and its effect on other variables through causal relationships in affecting project success and failure. In this regard, the PMPAC model, as suggested by Din, Abd-Hamid and Bryde (2011), was modified for the purposes of this study to a PMPACC model, expanding the research

of the fundamental PMPA model as developed by Bryde (2003a). However, no research has been undertaken to date, to the best of the researcher's knowledge that includes the PMPAC model of Din, Abd-Hamid and Bryde (2011) in combination with *change management.* Key research findings have shown certain variables to be prevalent from these studies, e.g., *leadership* and *KPIs* as highly significant.

The research findings derived from the model focused on two sub groups – Saudi and non-Saudi based organisations – and found significant impact for this research despite identifying some variances. It should be noted that the size and scope of this research gave rise to the largest sample using a PMPA based model. In targeting the Saudi region, the current study exceeded the Rehman, Usmani and Al-Ahmari (2012) study sample by 73% and included both the public and private sectors and a greater number of industry sectors than other Saudi focused research. In that regard, this study undertook to provide a more comprehensive view of project management performance within Saudi Arabia and was inclusive, enabling greater generalisations to be made. However, it must be acknowledged that the composition of the sample population was preponderantly non-Saudi at 80%, which had the potential to skew the generalisations to be drawn. Nevertheless, although the respondents may or may not necessarily reflect the views of Saudi project managers, the group was representative of the labour market and current project management professionals.

In general, the region is under significant pressure to meet escalating project demands, and having sufficient trained resources is critical to project success. Being reliant on other resources to address weaknesses has been shown to contribute to project failure (Al-Kharashi & Skitmore 2009). The research confirmed the variable of *staffing* as the most important variable in project management performance. The research findings further demonstrated that project management staff overwhelmingly, in both Saudi and non-Saudi based firms; felt that *change management* was central to project success. This conclusion not only supports the findings of Bryde (2003a) and Qureshi, Warraich and Hijazi (2008), but also further illustrates the importance of education and professional development in the project management profession, and the fact that there is a dearth of educated staff in the region. In addition, this research agrees with Bryde's (2003a) research finding that there is a supply shortage in terms of specific skills needed for project management, which can be correlated to *change management* in the sense that a change in the project scope would be necessary since required skills were missing.

7.1.1 The influence of specific variables

Previous studies involving various PMPA models have shown the important influence of specific variables on project outcomes (Bryde 2003a; Fortune & White 2006; Qureshi, Warraich and Hijazi 2008; Din, Abd-Hamid & Bryde 2011; Ali, Al-Sulaihi and Al-Gahtani (2013); Mir & Pinnington 2014). Further to this, the research undertaken by Al-Mashari and Al Mudimigh (2003), Zou and Lee (2008) and Al-Turki (2011) have shown the effects of *change management* on projects to be positive. Specifically, Al-Turki (2011) found that *change management* was integral from the project outset, while Zou and Lee (2008) found that *change management* proved beneficial in controlling project costings, but integrating this aspect within the PMPA had not been shown. Within this context, it has been shown that *change management* can significantly affect resources and how those resources are deployed to achieve project success (Susman, Jansen & Michael 2006; Izzo & Withers 2000).

Retaining and developing staff is integral to project outcomes as identified by the current research, which supports that of Rehman, Usmani and Al-Ahmari (2012) and correlates to a need to increase staffing resources in organisations developing projects. In conclusion, increased investment in education and training is required in order to increase the likelihood of positive project outcomes, especially given the sizeable number of projects and investment already underway in the region.

With regard to *leadership*, the research determined that within non-Saudi based organisations there was a higher level of leadership proficiency than Saudi based firms in the KSA. This supports the observation that increased training is required due to a shortage of skilled staff in the region particularly for Saudi based organisations. The importance of having qualified project leaders extends to the degree of legitimate authority the PM can have over staff. Furthermore, Vroom and Jago (2007) have shown that PMs who are respected because of their knowledge and skill are instrumental in achieving goals, such as project outcomes and project success.

The data related to *leadership* from respondents in both Saudi and non-Saudi organisations indicated that overall, the firms executed business change effectively. Their responses made it clear that *leadership* was central to both cohorts, and directly linked to *staff* and *change management* within Saudi based organisations, as there was a high correlation between them. For non-Saudi based organisations, *leadership* was strongly correlated with *staff and policy and strategy*. In both cases, the association of *leadership* with *staff* was shown to be combination that was able to maintain direction and focus and provide inspiration (Base 2010).

In the context of sustaining a competitive advantage, *change management* and continuous process improvements are essential for the development of competitive strategies. Having leaders who can inspire staff to enact or facilitate change requires an organisational culture that embraces innovation and change (Base 2010). Furthermore, the research confirmed Alfaadel, Alawirdhi and Al-Zyoud (2012) findings that there was great need for specialised leadership skills throughout the various phases of the project.

Specialised and skilled leadership has been shown to reduce the risk of failure (Rehman, Usmani, & Al-Ahmari 2012) which was confirmed by this research study. However, if the leadership is inherently flawed, the project will always be in greater danger of failing, as effective leaders have been shown to implement corporate strategies to affect business change or project outcomes (Epstein 2004), while ineffective leaders show little initiative or strategic understanding.

In order to measure the levels of business change, organisational success or indeed project outcomes, there is a need for establishing and measuring those aspects that affect outcomes. Previous research has shown (Qureshi, Warraich &Hijazi 2008; Ali, Al-Sulaihi & Al-Gahtani 2013; Mir & Pinnington 2014) the value *key performance indicators* can have in measuring project success. KPIs are seen as a means of conducting business change by establishing benchmarks for conducting performance assessment in order to enact strategic managerial directives (Kaplan & Norton 2001).

It has been argued by Porter (1992) that solely focusing on measuring financial outcomes is too narrow and simply looks at achieving short-term gains with disregard of long-term value creation. Kaplan and Norton (2001) argued that it is necessary to look at financial measures and link them to strategy by broadening the scope to non-financial indices. Ali, Al-Sulaihi and Al-Gahtani (2013) specifically outline 10 KPIs as a framework for determining success. While Bryde (2003a), Thomas and Fernandez (2008), Qureshi, Warraich and Hijazi (2008), Din, Abd-Hamid and Bryde (2011) and Mir and Pinnington (2014) have also noted the need for KPIs as means to measure performance but until Ali, Al-Sulaihi and Al-Gahtani (2013) there has not been a definitive list as to what those KPIs should be. The current research did not specifically set out to determine what the KPIs should measure, but notably found that KPIs had the lowest level of agreement among the respondents in terms of their value as a measure of the success of project objectives.

This can be interpreted as significant as it deviates from other findings and speaks to the perception of KPIs and what alternative means of measuring change, strategy, and project outcomes could be used and why. Here it is suggested that in order to provide clarity and consistency for industry sectors like construction, that a group of measurements be adopted by the project management profession to establish industry based benchmarks across each industry within each region. The adoption of certain specified KPIs would provide a framework for project leaders, stakeholders, and investors by defining what is to be measured and how to measure it. This would alleviate the discrepancies and interpretive nature of the perception of the value of KPIs, which has been uncovered in this research.

On two issues, the Saudi and the international firms recorded clearly dissimilar findings. First, Saudi firms placed greater importance on the relationship between *staff* and life cycle management processes than non-Saudi organisations. The conclusion drawn from this is that different organisations have slightly different perceptions of how staff contributed to the life cycle process. Second, the function of *financial management* practices was perceived differently by the two cohorts. Saudi based organisations embed *financial management* within *change management*, which could be construed to be reactionary and not planned. Conversely, non-Saudi based organisations *financial management practices* are derived from both set policies and guidelines and function as part of an overriding strategy, which implies specific planning.

7.1.2 In summation

The research set out to achieve specific objectives by employing the PMPAC model with a new criterion (*change management*) and undertake a broader, regionally specific investigation across all sectors in KSA. In this regard, the research could be deemed to have met its objective. The data generated from the online questionnaire, once analysed, increased our level of understanding of the ways in which PM is used in the KSA, whether there is sufficient training and knowledge among project managers, and how the PMs' view project success. In addition, the value of the PMPAC model in determining success was considered, along with the effect of *change management* as a marker of success. The research considered the effect of *change management* on project success, notably as part of the project or as part of the business strategy. It is anticipated that the results of the research will expand the theoretical level of PM knowledge and illustrate the nature of project management in the Saudi region.

This research set out to expand the level of knowledge of PMP within Saudi Arabia and to understand the correlations between criteria within the framework model and to add value to the field of PM, as well as provide a valuable assessment tool that would have practical applicability. More importantly, and central to the research was the role *change management* plays in the PMPA process and how this influences project performance and project success. The researcher in conducting this research specifically identified future research opportunities as described below.

7.1.3 Research contribution

This thesis contribution has added more business based KPIs. Those shown to be relevant were:

- The method to manage the important KPIs developed in the organisation.
- There was a method to manage project objectives and delivery of project benefits post implementation.
- There was a procedure to measure stakeholder perceptions.
- A method covering a wide range of KPIs was developed to increase organisational capability.

The thesis further verified the value of change by assessing change management within the project environment. It further expanded the critical success factors (CSFs) as follows:

- The method to manage the importance of project management KPIs was developed in the organisation.
- There was a method to manage project objectives and link delivery of project benefits post implementation.
- There was a procedure for measuring stakeholder perception.
- The method against the wide range of project management KPIs in particular to increase organisational capability was similarly developed.

7.2 Future research opportunities

The primary goals of this research study explored project management performance and how this is assessed in determining project success in Saudi Arabia. By understanding the correlative relationships of those variables employed within the framework model, the degree of influence of specific variables, and how they affect other variables would elucidate why projects succeed or fail. From the results of this research, certain recommendations for future study were identified, as indicated below.

1 Future research can be explored specifically for Saudi based or non-Saudi based organisations as these were the distinct sub groups that responded to the questionnaire. Similarly, any future research could be conducted within solely public or private sectors within the region. Within that, it is reasonable to suggest that future research could be geographically driven within principal regions where projects, i.e., construction projects, are being undertaken, e.g., the central Riyadh region.

2 This research employed a limited 5-point Likert scale, which has been interpreted as being narrow. Future research could be conducted using a broader 7-10-point Likert scale as proposed by Dawes (2008). This yields greater validity of the data and interpretations and as was identified out in leadership analysis. The 5-point Likert scale may well have limited the research determinations. In the case of the test of significance, it was revealed that some variables deviated from the 'goodness of fit' standards, thus future research should undertake to consider this aspect in further studies.

3 The research questionnaire was only written in English by a non-native English speaker. This may have posed several challenges to the readers, given their level of English comprehension. It would be recommended that future questionnaires be written in both English and Arabic, to provide adequate meaning, understanding, and ease of comprehension for the prospective respondents. It may also facilitate clarity and reduce complexity and any advantages that might otherwise be afforded those with greater English language skills.

4 The nature of an online questionnaire is restrictive and can lead to bias given the structured questions. This questionnaire was taken from previous research and is subject to participant recall, whereby information provided could be limited and be subjective, based on the respondent. It is suggested that future research should allow for more objectivity by including open-ended questions. Increased participation within the organisations sampled may reduce the risk of recall bias.

5 In Saudi Arabia, projects face certain challenges, namely financial, scope, administrative, technical, legal, human resource; technology and environmental. Future research should consider the impact of the correlations of these challenges when interacting as opposed to research that investigates them in isolation.

6 Future research into staffing is suggested, given the region's high demand for skilled labour in the area of project management. Research should be conducted to identify the levels and scope of skills available and specifically attempt to identify those skills gaps. From this research, a

plan could be devised to target those areas, with a view to increasing the skill and knowledge base to increase the staff available.

7 Adapting the variables that were investigated in the PMPAC model by considering other independent variables that have been identified as theoretically relevant could be undertaken. Considering alternate variables within the PMPAC model, could be tested to determine their influence on project success. Examples of alternate variables could include the proposed KPIs drawn up by Ali, Al-Sulaihi and Al-Gahtani (2013) or by extending KPI s that include both internal and external measures to benchmark organisational elements specifically within public or private industry sectors. If focusing on the public or Saudi government based projects, support and or funding could be targeted to help to develop a framework for this sector.

7.3 Summary

This research focused on project management performance within both the public and private sectors in Saudi Arabia in order to increase understanding of those factors that influence project success. The research investigated the effects of the relationships of specific variables associated with the PMPAC model used in this research. The purpose of examining these variables was to determine the importance and specific causal effects the variables had on project success as part of project management performance.

This research study was conducted using an online web survey that yielded 419 valid responses that were used to evaluate the effectiveness of the model and were allocated two specific sub groups. The research employed two levels of statistical analysis that tested the validity of the model. The findings of the research yielded certain predicted outcomes and identified some results that can be construed to differ from other research results. The most unexpected findings were in the variable of KPIs, which contradicted other research outcomes and deviates from the value placed in strategic theory, project management performance assessment, and project success.

From the statistical analysis, an expected outcome was determined with project management staffing being identified as the most critical determining factor in project management performance and project success. This was true in both cohorts and was substantiated by market conditions within the region as noted by previous research in Chapter 2. The significance of *change management*, the independent variable that was added to the existing model was through the SEM analysis in both sub groups seen as highly correlated with other variables, such as *leadership*, and

staff. The research outcomes and statistical analysis identified the fact that *change management* was a process that was embedded with other variables as part of the business strategy of the organisations surveyed.

In summation, this research clearly identified specific types of variables that organisations employ as strategic resources within the project management environment, as a means to effect project success and specifically determined those that were held to have higher degrees of influence over project outcomes. The framework model tested and analysed organisations at specific times in their project cycle. The results gleaned from the research provided specific causal connections of variable relationships at that juncture. Results may differ when analysed at other times in the project life cycle.

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APPENDICES

Appendix A	Frequency Distributions of Responses in the Survey Questionnaire Used to Operationalise 8 Variables from 31 Items
Appendix B	Survey – Project Management Performance in Saudi Arabia: An Exploratory Study into the Constructs that Most influence Project Success
Appendix C	Information about the project
Appendix D	Information about accessing the survey online
Appendix E	Information from the Ethics Committee

APPENDIX A

Frequency Distributions of Responses in the Survey Questionnaire Used to Operationalize 8 Variables from 31 Items

Item		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Not Applicable (3)	Total	% Not Applicable
1. PROJECT MANAGEMENT LEADERSHIP									
L1	The project was a vehicle for tackling business-led change within the organization	15	16	120	179	45	44	419	10.5%
L2	Assistance was received in identifying the appropriate person to manage the project	19	46	71	192	71	20	419	4.8%
L3	Features of a projects culture were developed i.e. project focus meeting, a common project language	17	39	76	206	70	11	419	2.6%
L4	The absence of one feature of a project culture will be covered by the existence of another feature	15	109	97	165	23	10	419	2.4%
L5	The project environment hindered the development of a project culture	22	74	88	167	55	13	419	3.1%
2. PROJECT MANAGEMENT STAFF									
S1	There was a procedure to increase Project Management capability through the development of team members	33	47	49	147	139	4	419	1.0%
S2	There was a formal process for evaluating the Project Management staff	30	50	66	191	78	4	419	1.0%
3. PROJECT MANAGEMENT POLICY AND STRATEGY									
PS1	Awareness of Project Management was raised by selling the benefits of Project Management	26	71	91	175	47	9	419	2.1%
PS2	Project Management was successful when it was developed as a formal practice within the organization	12	34	65	171	129	8	419	1.9%
PS3	The implementation of Project Management policy and strategy involved major organizational change and obstacles to the change was recognised and overcome	14	42	87	187	70	19	419	4.5%

4. PROJECT MANAGEMENT PARTNERSHIP AND RESOURCES									
PR1	There was an open two-way partnership with customers and suppliers during the project plan	16	46	84	190	69	14	419	3.3%
PR2	The project stakeholders were formally involved in the project execution	27	72	77	159	78	6	419	1.4%
5. PROJECT MANAGEMENT LIFE CYCLE MANAGEMENT PROCESS									
LP1	A model of critical business processes was used throughout the project life cycle	22	71	87	175	46	18	419	4.3%
LP2	The role of life cycle models was recognized in developing features of a project culture	15	74	97	181	34	18	419	4.3%
LP3	There was a written procedure covering all stages of the project life cycle, including pre and post implementation stages	24	53	61	181	94	6	419	1.4%
LP4	Procedures were updated and benchmarked as response to changing requirements	24	58	66	189	75	7	419	1.7%
6. KEY PERFORMANCE INDICATORS									
KPI1	The method to manage the important Project Management KPIs was developed in the organization	28	64	83	164	62	18	419	4.3%
KPI2	There was a method to manage project objectives and link delivery of project benefits post implementation	20	54	79	206	50	10	419	2.4%
KPI3	There was a procedure for measuring stakeholder perceptions	28	79	96	165	32	19	419	4.5%
KPI4	The method against a wide range of Project Management KPIs, in particular to increase organizational capability, was developed	23	72	115	154	36	19	419	4.5%
7. FINANCIAL MANAGEMENT PRACTICES									
F1	A financial calculation procedure was used	12	20	57	209	116	5	419	1.2%
F2	There was a financial contingency plan which was readily available	20	68	76	174	71	10	419	2.4%
F3	The amount used to finance the project is based on the original estimated cost	20	54	70	206	62	7	419	1.7%

F4	Inflation allowance and price escalation were considered in the cost estimation	32	70	69	168	70	10	419	2.4%
F5	Early purchase of materials helped to reduce the effect of price escalation	27	34	74	167	97	20	419	4.8%
F6	Monthly historical costs were used to determine wage rates	27	73	79	171	49	20	419	4.8
8. PROJECT CHANGE MANAGEMENT									
CH1	The project is organized on a Work Breakdown Structure (WBS) format and with quantities assigned to each WBS for control purposes prior to total project budget authorization	18	45	78	195	73	10	419	2.4
CH2	At project close-out, an evaluation is made of changes and their impact on the project cost and schedule performance for future use as 'lessons learned'	17	59	73	189	71	10	419	2.4
CH3	Project personnel take proactive measures to promptly settle, authorize and execute change orders on this project	15	46	100	208	42	8	419	1.9
CH4	Authorization for change is mandatory before implementation	7	32	72	195	107	6	419	1.4
CH5	Areas susceptible to change are identified and evaluated for risk during review of the project design basis	11	36	95	207	59	11	419	2.6
Total		636	1708	2498	5633	2120	394	12989	3.0%
Total %		4.9%	13.1%	19.2%	43.4%	16.3%	3.0%	100.0%	0.0%
Total (Not Applicable = 3)		636	1708	2892	5633	2120	0	12989	0.0%
Total % (Not Applicable = 3)		4.9%	13.1%	22.2%	43.4%	16.3%	0.0%	100.0%	0.0%

APPENDIX B

Project Management Performance in Saudi Arabia: An Exploratory Study into the Constructs that Most Influence Project Success

Page One

1. By completing this survey you are consenting to being part of this research study *

- ○ Yes

New Page

2. Your citizenship is *

- ○ Saudi
- ○ Non Saudi

3. Your organization is *

- ○ Saudi Arabian (the company is based in saudi arabia)
- ○ International (the company is based overseas)

4. Type of projects *

- ☐ Industrial Projects (such as manufacturing, power generation, petroleum, etc.)
- ☐ Residential Projects (houses, apartments, etc.)
- ☐ Commercial (towers, hospitals, schools, shopping centres, warehouse, hotels, etc.)
- ☐ Highway Construction (roads, highways, bridges, etc.)
- ☐ Heavy Construction (water and sewer line projects, dams, etc.)
- ☐ Telecommunications Projects
- ☐ Other

5. Most of projects are located in *

- ☐ Southern Saudi Arabia
- ☐ Western Saudi Arabia
- ☐ Eastern Saudi Arabia
- ☐ Central Saudi Arabia
- ☐ Northern Saudi Arabia

New Page

6. The project was a vehicle for tackling business-led change within the organization *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

7. Assistance was received in identifying the appropriate person to manage the project *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

8. Features of a "projects culture" were developed i.e. project focus meeting, a common project "language" *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

9. The absence of one feature of a project culture will be covered by the existence of another feature *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

10. The project environment hindered the development of a project culture *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

New Page

11. There was a procedure to increase Project Management capability through the development of team members *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

12. There was a formal process for evaluating the Project Management staff *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

13. Awareness of Project Management was raised by selling the benefits of Project Management *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

14. Project Management was successful when it was developed as a formal practice within the organization *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

15. The implementation of Project Management policy & strategy involved major organizational change & obstacles to the change was recognised and overcome *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

New Page

16. There was an open two-way partnership with customers and suppliers during the project plan*

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

17. The project stakeholders were formally involved in the project execution *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

18. A model of critical business processes was used throughout the project life cycle *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

19. The role of life cycle models was recognized in developing features of a project culture *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

20. There was a written procedure covering all stages of the project life cycle, including pre & post implementation stages *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

21. Procedures were updated & benchmarked as response to changing requirements *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

New Page

22. The method to manage the important Project Management KPIs was developed in the organization *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

23. There was a method to manage project objectives and link delivery of project benefits post implementation *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

24. There was a procedure for measuring stakeholder perceptions *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

25. The method against a wide range of Project Management KPIs, in particular to increase organizational capability, was developed *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

New Page

26. A financial calculation procedure was used *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

27. There was a financial contingency plan which was readily available *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

28. The amount used to finance the project is based on the original estimated cost *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

29. Inflation allowance and price escalation were considered in the cost estimation *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

30. Early purchase of materials helped to reduce the effect of price escalation *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

31. Monthly historical costs were used to determine wage rates *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

New Page

32. The project was completed as per schedule *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

33. The project was completed within budget *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

34. The completed project was managed in an efficient manner *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

35. The project was completed within acceptable quality *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

36. The output from the completed project functioned as expected *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

37. The output from the completed project is used by its intended user *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

38. The output from the completed project has directly benefitted the intended user *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

39. The output from the completed project has had a positive impact on the client's performance *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

40. The output from the completed project has a positive impact on my company's business results *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

41. My company has learned from the completed project and this will lead to better projects in the future *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

New Page

42. The project is organized on a Work Breakdown Structure (WBS) format and with quantities assigned to each WBS for control purposes prior to total project budget authorization *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

43. At project close-out, an evaluation is made of changes and their impact on the project cost and schedule performance for future use as 'lessons learned' *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

44. Project personnel take proactive measures to promptly settle, authorize and execute change orders on this project *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

45. Authorization for change is mandatory before implementation *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

46. Areas susceptible to change are identified and evaluated for risk during review of the project design basis *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
- Not Applicable

47. Please enter your E-mail to win I Pad Mini Wi-Fi+Cellular 32GB

THE UNIVERSITY OF ADELAIDE AUSTRALIA

ECIC Entrepreneurship Commercialisation and Innovation Centre

APPENDIX C

Project Management Performance in Saudi Arabia: An Exploratory Study into the Constructs that Most Influence Project Success

DEAR PARTICIPANT

We wish to invite you to participate in an important study of project management practices in the context of projects at management level in Saudi Arabia, which is being undertaken as a doctoral research at the University of Adelaide, Australia.

Your participation in this project is voluntary, and you are free to withdraw at any stage without affecting your status now or in the future. There is no risk to you in being involved in this project. On the other hand, the analysis of data that you and others provide for the study, and recommendations flowing from it, will be critical to improve project management performance practices.

ABOUT THE SURVEY

The survey was structured in four parts. The first section obtained descriptive data about respondents' organization. The next section asked the respondent to focus on a recently completed project. In section three data were elicited about the project management practices, financial management practices, change management practices and Project Success of the recently completed project.

WHY PARTICIPATE?

As a participant in the study, you will receive a summary report of this study. The underpinning belief of this research is that professionals are happy to reflect on their experiences and to arrive at some kind of formative assessment of practices. This research on various aspects of project management performance provides such an opportunity.

WHAT ARE THE EXPECTED OUTCOMES?

The study will enable us to asses project management performance in terms of project management, financial management and change management practises within projects in Saudi Arabia. Also, using results to develop sustainable solutions for the development of construction projects in Saudi Arabia. In addition, the researcher will use the data for academic papers and conference presentations.

WHAT ABOUT PRIVACY?

The researcher will take every care to remove any identifying material from responses as early as possible. Likewise the data will be used for academic papers and conference presentations and individuals' responses will be kept confidential by the researcher and not be identified. The data will be retained for five years within the Entrepreneurship, Commercialisation and Innovation Centre (ECIC), University of Adelaide.

Please contact the research team if you have any questions.

This project has ethics approval from the University of Adelaide. You are welcome to contact the Human Research Ethics Committee's Secretary on phone (08) 8303 6028 if you have any concerns or questions.

Yours sincerely,

Dr. Graciela Corral de Zubielqui
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+966550927627

APPENDIX D

Contents of the email that will be sent to the participants in this research.

1 Subject will contain:

Invitation to participate in the research on *Project Management Performance in Saudi Arabia: An Exploratory Study into the Constructs that Most Influence Project Success*

2 Text in the body of email/letter

Dear Participant
I am a PhD candidate at the University of Adelaide, Australia and would like to invite you to participate in my research by sparing around 07 to 13 minutes for a survey.

The survey was structured in four parts. The first section obtained descriptive data about respondents' organization. The next section asked the respondent to focus on a recently completed project. In section three data were elicited about the project management practices, financial management practices, change management practices and Project Success of the recently completed project. If you wish to participate in the survey, click on the below link.

3 Who the email will appear to be from in the recipient's inbox

The email will appear to come from Salem Shuaib

4 Text that clearly identifies the researcher

The standard signature of the University of Adelaide staff member contains information:
Salem Shuaib, PhD candidate
Entrepreneurship, Commercialisation & Innovation Centre
The University of Adelaide, AUSTRALIA 5005
Mobile: +61 (0) 432600263
Fax : 08 8303 7512
e-mail: salem.shuaib@adelaide.edu.au

CRICOS Provider Number 00123M

APPENDIX E

The University of Adelaide
Human Research Ethics Committee (HREC)

This document is for people who are participants in a research project.

CONTACTS FOR INFORMATION ON PROJECT AND INDEPENDENT COMPLAINTS PROCEDURE

The following study has been reviewed and approved by the University of Adelaide Human Research Ethics Committee:

Project Title:	Project Management Performance in Saudi Arabia: An Exploratory Study into the Constructs that Most Influence Project Success
Approval Number:	**H-2013-059**

The Human Research Ethics Committee monitors all the research projects which it has approved. The committee considers it important that people participating in approved projects have an independent and confidential reporting mechanism which they can use if they have any worries or complaints about that research.

This research project will be conducted according to the NHMRC National Statement on Ethical Conduct in Human Research (see http://www.nhmrc.gov.au/publications/synopses/e72syn.htm)

1. If you have questions or problems associated with the practical aspects of your participation in the project, or wish to raise a concern or complaint about the project, then you should consult the project co-ordinator:

Name:	**Dr. Graciela Corral de Zubielqui**
Phone:	+61 8 8313 7491

2. If you wish to discuss with an independent person matters related to:

   - making a complaint, or
   - raising concerns on the conduct of the project, or
   - the University policy on research involving human participants, or
   - your rights as a participant,

   contact the Human Research Ethics Committee's Secretariat on phone (08) 8313 6028 or by email to hrec@adelaide.edu.au

secretariat/ethics/human\complaints