Gordon Institute of Business Science
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The relationship of contrasting project governance approaches with achieving ERP project success

Examining the relevance of applying the stewardship and agency theories to how projects are governed in order to ensure successful ERP project execution

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Abstract

This dissertation assesses contrasting approaches to project governance and their correlation with ERP project success. The opposing perceptions of agency theory and stewardship theory are applied in the research to deconstruct and describe the different forms and functions of project governance. Accordingly, every project governance approach is either more oriented towards the interests of the shareholders or the stakeholders, and is either controlled through strict processes and procedures or through a focus on project outcomes.

Questionnaires were sent via email to a target population comprising of ERP professionals, ERP project managers, and others with ERP project experience. 166 usable responses were obtained.

Regression and correlation analysis revealed that ERP project success has a significant relationship with a project governance methodology that increases the degree to which it is stakeholder oriented. Whilst ERP project success is not correlated with the type of control approach implemented within the project governance structures.

These findings offer additional evidence on the notion that governance approaches in which stewardship principles are adopted are meaningful in the context of achieving ERP project objectives.

Keywords: ERP; Project Success; Project Governance; Stewardship Theory; Agency Theory

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

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Contents

List of tables

List of figures

1. Review of the topic

1.1 Understanding the title

This dissertation plans to ascertain if genuine relationships exist between the successful outcomes of enterprise resource planning (ERP) system projects (the successful achievement of ERP project objectives) (Baccarini, 1999; ul Musawir, Serra, Zwikael & Ali, 2017), and the types of project governance principles (the framework or culture that guides how project decisions are made) (Müller, 2009; Pinto, 2014). These 2 constructs, and the many different facets that define these principles, have been tested via the collection and analysis of the relevant data from ERP professionals and ERP project staff involved in significant ERP projects at South African organisations. It has then been determined which specific forms of project governance methods can have a greater effect on the successful outcome of ERP projects.

1.1.1 Project success definition

Every project that is embarked on by a team within an organisation is initially done so in the hope that the project will yield successful outcomes that meet the objectives and satisfaction criteria as laid out by the involved stakeholders. Yet, for decades, the notion of project success has been discussed and debated amongst many of the top researchers and practitioners in the field of project management, and there is rarely an agreement on a standard set of project success factors that differentiate a triumphant project from a failed one (Pinto & Slevin, 1988). Mir and Pinnington (2014) in their paper on exploring the connection between project management and project success identified that while top researchers identify project success "as a uni-dimensional construct concerned with meeting budget, time and quality", other researchers "consider project success a complex, multi-dimensional concept encompassing many more attributes" (p.202).

For the purposes of this research, the project success criteria based on the work by Khan, Turner and Maqsood (2013) will be utilised as they have created a consolidation of a number of project success models based on the literature created by the leading researchers in the field over the last forty years. Therefore, a successful project is determined via the criteria of efficient project execution, organisational advancements, project impact, satisfying the stakeholders, and future potential.

1.1.2 Project governance definition

Governance, but more specifically, corporate governance is a commonly understood term in the academic and business realms and is well defined by Klakegg, Williams, Magnussen and Glasspool (2009) as “the use of institutions, structures of authority, and even collaboration to allocate resources and coordinate or control activity in society or the economy.”

Project governance then is seen to be a mechanism for managing projects that is based on, and is an extension of, an entity’s core governance principles, but is specifically applied to individual projects as a management tool that spans across the entire lifecycle of the project and dictates a consistent procedure to be followed that allows for the project to be controlled effectively and ensure that it is executed successfully through project practices that can be repeated and have proven to be fruitful in the past (Joslin & Müller, 2016; Müller & Lecoeuvre, 2014; PMI, 2013).

1.2 Background to the research topic

The implementation and running of sophisticated Enterprise Resource Planning (ERP) systems by large organisations come with a high initial monetary cost, and continuous maintenance costs thereafter. However, despite the necessity of corporations to run the latest ERP software, there is a 90% chance that the implementation project will encounter major difficulties resulting in the project being delivered over budget, past due, with technical faults, or do not achieve expected benefits (Wang & Chen, 2006). It is therefore logical that any possible success factors relating to these projects should be applied effectively to enhance the probability of successful project completion. One such success factor which has been growing in popularity for the last decade, is project governance (Biesenthal & Wilden, 2014; Serrador & Turner, 2015).

The necessity for large organisations to implement the latest and most sophisticated (thus making it expensive) ERP software has been fuelled by the increase in competitive pressure as a result of the globalisation of companies (Teltumbde, 2000). Sophisticated ERP systems are used to manage internal and external resources by integrating as many business functions and processes as possible so that a complete view of the business can be provided from a single information point and information systems architecture (Klaus, Rosemann & Gable, 2000). A full and comprehensive implementation of an ERP system by an organisation will span across and affect all functional silos within the business. The sheer scale of these projects generally, and the insights gained from case studies of company journeys through the ERP implementation process, indicate that prominent hazards and uncertainty are

guaranteed to be experienced throughout the project life cycle, and therefore, most firms bring in firms from outside the organisation to implement and manage the transition in conjunction with the organisation's internal teams (Wang & Chen, 2006).

Project success can take on many forms depending on the type of project being executed but can generally be defined as a set of measures of success criteria, being objective or subjective, that if achieved are indicative of meeting the desired project outcomes (Müller & Jugdev, 2012). However, due to the lower than expected success rates found in executed projects worldwide, researchers have had to explore the vast number of project success factors to ascertain which are most effective and relevant (Badewi, 2016).

The specific success factor to be researched in this paper is that of project governance, and which characteristics of project governance are more influential in achieving project success. Wang and Chen (2006) iterate that in order for business to increase the chances of achieving a successful ERP implementation, they need to mitigate the risks of non-delivery on the project by minding and adopting specific governance practices relevant to the context in which that organisation finds itself in.

The principles of project governance are applied using the project relevant set of policies, plans, rules, strategies, responsibilities and procedures to launch, manage and control projects and their outcomes (Pinto, 2014). The method of governance of projects within an organisation is usually aligned with the corporate governance policies and culture already instilled in that organisation to ensure that projects are supported in such a manner that the corporate objectives are top of mind and achieved (Müller & Lecoeuvre, 2014). Most research published in academic journals regarding the application of project governance is qualitative in nature, with only a few top academic papers following a quantitative approach to providing evidence of the association with project success. Two relevant quantitative studies on the topic include Joslin and Müller's (2016) paper investigating the relationship between governance and project success, and Wang and Chen's (2006) study into the issue of interfirm governance and ERP implementation projects. However, Joslin and Müller (2016) generalise the results in their study and apply it to any type of project undertaken by an organisation, whereas, although Wang and Chen (2006) specifically focus their study on governance in ERP implementation projects, but they analyse the relationship between the client and the ERP supplier, rather than applying a project governance lens derived from theory to evaluate the relationship between the governance techniques applied by project leaders and sponsors on the project team and affected stakeholders to attain project success.

The researcher will attempt to test the implications and strength of the association between project governance to the positive or negative outcomes of a large-scale ERP project. The study will make use of a framework that operationalises specific governance categories as used on a range of types of projects and is based on the work done by Müller and Lecoeuvre (2014). This governance framework manages to split all the characteristics of governance into two separate dimensions. The first dimension being the degree at which a stakeholder versus a shareholder approach is taken when applying governance principles, as formulated in the research done by Clarke (1998); and the second dimension being the degree at which governance follows a behavioural or process control approach versus a project outcomes-based approach, as outlined by the work of Ouchi (1980).

The use of these two separate paradigms of governance allows the researcher to also contrast the different components of the stewardship and agency theories. The theory of stewardship is taken to explain that managers and project managers will act in a responsible manner in regard to the assets they control and their responsibilities, and adopt more of a stakeholder approach to their management style by which trust, and the management of project outcomes is used as the instrument to steer all involved in achieving the project goals and satisfying the needs of a wide range of stakeholders (Davis, Schoorman & Donaldson, 1997; Joslin & Müller, 2016). Conversely, agency theory, which implies that management can be assumed to act in their own self-interests and will employ more an approach that pleases the needs of the shareholders over the interests of other stakeholders, whilst adopting a strict controls-based approach to managing project teams (Toivonen & Toivonen, 2014).

1.3 Research problem

The research problem is that although ERP implementations and supporting projects are necessary, yet expensive and time consuming, they are not successfully delivered without faults on a consistent basis. Failure on these projects is indicated by the project exceeding its budget and time frame through project teams missing deadlines and underperforming. It is of the opinion of the researcher, and top academics in the field of project management that this is due to a poor or incorrect approach to project leadership and governance. Thus, the research question is whether or not a relationship exists between specific styles of project governance and ERP project success. This question will be answered by refining it down into two research questions to be tested, namely, does a stakeholder-oriented approach to project governance on ERP projects positively relate to project success, and does a project outcomes approach to project governance positively relate to project success.

1.4 Business needs for the study

Within most large corporations and organisations, project management has become a business process that sits alongside and in conjunction with most of the typically known business functions such as finance, marketing, operations, and IT (Kenny, 2003). Furthermore, it is evident that over the last three decades business and organisations have been progressively utilising the practice of project management as an enabler to increase the productivity within the various business function, and within the organisation as a whole (Frame, 2003).

However, in spite of the above, ul Musawir et al. (2017) identified in their research that an alarming number of projects embarked upon by organisations are lacking in a rigorous approach and process for ensuring that value is achieved from the project in terms of that entity's strategy, and that the adoption of an effective from of project governance may provide the key to ensuring project success, but more practical evidence is needed.

It is also worth considering that for a number of decades an investment in an ERP system by any organisation has proven to be a significant and complex undertaking, and that the support of top management and the appointment of a project champion have become one of the most critical project success factors (Schmidt, Lyytinen, Keil, & Cule, 2001). This infers that all entities should pay great consideration to which project governance technique to adopt in order to lessen the risk that the project will not succeed in achieving its objectives.

The research will therefore hopefully have a practical application in the business world as potential ERP system adopters and firms that specialise in the installation of ERP systems for clients can use the results of the research to develop project governance structures and methods that may increase the chances of a successful implementation.

If the results in this research were to confirm that a stakeholder-oriented and project outcomes approach are more suited to achieving ERP project success, then the business world may be interested to note that a project governance approach built of stewardship theory is more likely to ensure project success for ERP implementations in South Africa.

1.5 Theoretical need for the study

As briefly mentioned in the previous section, ul Musawir et al. (2017) emphasised in their research that while many top academics and literature within the field of project management do agree that project governance has a significant role to play in terms of helping a project

team and organisation achieve project success, but there is still robust debate inferring that the research already conducted in this area and field has been found wanting in terms of exactly what forms of project governance lead to realising the potential project benefits.

The motivation for this study is based on the researchers prior experience with regard to project management and was further inspired by the call for further research as outlined in the study by Joslin and Müller (2016), and will hopefully contribute to the body of knowledge by illuminating the relationship between what project governance method can be adopted, and whether or not that approach will give an entity a better chance at achieving project success or not, as well as inspire future researchers to identify alternative methods of project governance to ascertain the most optimal approach that most guarantees project success.

This research around the application of project governance methods to achieve ERP project success will therefore be relevant to academics in helping to build on or confirm the relevance of specific and contingency theories around project governance, project management, and decision making.

1.6 Research scope

The scope of the research will focus on and be limited to participants that have been selected based on the criteria of working for a South African company or organisation that has attempted to, successfully or unsuccessfully, implement a sophisticated version of ERP software that integrates most of the functional silos within the organisation. Furthermore, these individuals need to have been directly involved in the ERP project or implementation in the position of: CIO or CTO, Head of the ERP or IT Department, Project Manager, ERP Professional or Consultant, Project Team Member (permanent employee at client), System End-User & Project Team Member (permanent employee at client), Solution Architect or Advisor, Client Manager, Business Stakeholder, Stakeholder at ERP Provider, or other position that requires direct project involvement.

The experience of these individuals will be seen as significant to the research as their direct involvement and support of the project over an extended period of time are crucial to increasing the chances of the project being executed successfully (Shanks, 2000)

The research will focus exclusively on testing project success and project governance.

1.7 Research purpose

It is assumed that there is a correlation between the methods used to govern projects and the achievement of project outcomes due to the alignment of corporate governance methods with the levels of performance achieved by management within an organisation (Badewi, 2016). The purpose of this research will be to apply the research around the link between project governance and project success done by Wang and Chen (2006) and Joslin and Müller (2016) by using the characteristics inherent in stewardship and agency theory to identify and comprehend which specific methods of project governance have a greater influence on project success or failure for ERP implementations and related projects at large corporations in South Africa.

The research will aim to contribute to any existing research around the potential success factors that enable the implantation and adoption of ERP software by companies and organisations.

In addition, there are a few sub-objectives of the study that will include:

a) Understand the number of successful ERP projects that have been completed recently by large corporations or government entities.

b) Understand which approaches to project governance are most commonly adopted by the business and government sectors that have executed large-scale projects in pursuit of implementing an ERP system.

c) Provide business and government sectors with a recommendation of which approach to project governance they should adopt when considering a large-scale ERP system implementation or related project.

1.8 Outline of the research

For the structure if this research, the following section is the literature review portion. The literature review section attempts to explore the relevant constructs and keywords applicable to the research topic, as well as apply specific areas of management theory as a base to help answering the research questions at hand. The review therefore begins by exploring the concept and grand scale of ERP projects, and then moves through the constructs of project

success factors and governance, project success, and project governance. The section ends with a review and synopsis of what is known and unknown around this specific research topic and related constructs.

Chapter 3 will outline the two hypotheses of the research that have been formed from the literature review, as well as the research problem.

Chapter 4 will outline, explain and defend the research methodology used in the study.

Chapter 5 will firstly present the collected data for this research and provide a thorough analysis thereof, while utilising the research methodology described in chapter four.

Chapter 6 will discuss and deliberate on the results that have been put forward in chapter five and link this to the constructs, theory and arguments presented in chapters one to three.

Chapter 7 will provide a conclusion to the study by summarising the principal findings of the research, the importance of these findings, the limitations inherent in this research, and some future research suggestions.

2 Theory and Literature Review

2.1 Introduction

The purpose of this research and literature review is to understand the relationship between the different possible approaches to project governance and project success with regards to ERP implementation and related projects. This literature review section provides an overview of the academic literature in order to provide definitions and context around the constructs in the field of project management and Enterprise Resource Planning systems. The constructs of the role of ERP, project success factors, governance, project success, and project governance are explored. The popular management theories of agency and stewardship theories, and their link to stakeholder and shareholder theories, are contrasted and linked to the aforementioned constructs.

2.2 ERP projects

A sophisticated Enterprise Resource Planning (ERP) system is a packaged application software that emerged less than three decades ago and has created around it a multibillion-dollar industry which spans across the largest software vendors in the world, with numerous management consulting organisations dedicated to the management and implementation of ERP systems created by third party software vendors (Klaus, et al., 2000). The idea behind an ERP system is to seamlessly integrate the standard business functions and information flow crucial to the structures of most organisations and usually beginning with the finance, accounting, human resources, supply chain, and customer functions (Umble, Haft & Umble, 2003).

ERP systems were originally designed and created due to the immediate needs to digitise and automate certain processes within the manufacturing sector (and soon afterwards in the retail sector), and luckily enough for the sectors, early development in the world of software was able to cater for this. The success of ERP in transforming this industry naturally led to the adoption of ERP by other industries in an attempt to transform organisations and companies in order to gain a competitive advantage (Zhu, Li, Wang, & Chen, 2010).

However, despite the high adoption rate of ERP systems by almost all the major corporations worldwide, a completely successful implementation (i.e.: perfectly on time, under budget, and with no disruption to on-going business processes) of the software is a rare occurrence even though implementation costs can be as high as 3% of total revenue (Ehie & Madsen, 2005).

Research indicates that most failures in implementation are due to the company being unable to match their needs with the required system architecture (Brynjolfsson & Mendelson, 1993).

Over the last few decades there have been a number of high-profile corporations that have experienced major issues with ERP implementations. These include a 168 million US Dollar write off due to an abandoned implementation by Unisource Worldwide, the bankrupting of FoxMeyer Drug, an abandoned implementation by Dell due to cost overruns, and a half a billion-dollar write-off by Dow Chemical (Ehie & Madsen, 2005; Grabot, 2008).

From a more overall and statistical point of view, it was estimated by the research of Fitz-Gerald and Carroll (2003) that around a quarter off all ERP implementation projects tend to run over budget, with roughly one in five projects being terminated or aborted before being fully implemented. They also found that forty percent of the respondents to their survey indicated that the ERP project was unsuccessful in terms of allowing the organisation to achieve its business objectives, and that the return on investment expected from implementing the ERP system was only achieved between six months or a few years more than was originally forecast or expected (Fitz-Gerald & Carroll, 2003).

Yet, although these high-profile examples of ERP implementation failures seem to indicate that a sophisticated ERP system should be avoided as the system itself may be flawed, it is widely held within the Information and Communications Technology field that almost all ERP implementation failures are not due to the inherent coding of the ERP software being wrong or laden with bugs, but rather that of other critical failure factors such as extensive customisation of the standard ERP software, poor conversion of legacy business processes onto the new ERP system, poor performances by the professional ERP consultants, and a lack of sufficient support and buy-in from the company's upper management (Zare Ravasan & Mansouri, 2016).

In contrast to the aforementioned high profile examples of failed ERP implementations, there are a vast number of case studies and research on how many organisations have been able to improve their competitive position through an ERP implementation as the system has enabled them to increase profit margins, improve on-time delivery rates, improving customer satisfaction, decrease WIP inventory, and faster credit checks, to name a few (Ehie & Madsen, 2005; Appleton, 1997). These benefits are realised by the organisation, along with the rise in knowledge processing abilities and general success of the company, if the organisation is able to effectively utilise the power and capabilities inherent in a sophisticated ERP system (Baykasoğlu & Gölcük, 2017).

As per the research of Mabert, Soni and Venkataramanan (2001), companies that implement an ERP system that runs over budget, and outside of the original time-schedule, will assess the implementation as unsuccessful due to not meeting the aspirations of the organisation, whereas an implementation that is within the pre-approved budget is seen by the company as successful, valuable, and that the ERP system is effective in running the scoped functions of the business. However, it must be argued that it is seemly quite short-sighted to solely base a successful ERP implementation solely on meeting the original project budget, as it has often been found that organisations discover that an ERP deployment has not been quite as successful as first thought only months after final installation (Zhu at al., 2010).

In their study, Joslin and Müller (2015) found that depending on which specific project management methodology (PMM) is chosen, this can explain as much as a 23 percent swing in whether the project will be successful or not, with the type of governance approach utilised within the organisation or project acting as both an antecedent and a moderator in the relationship between the PMM and a successful project.

Therefore, in order to successfully manage a complex ERP implementation project in a cost-effective, timely, and efficient manner, an appropriate mix of governance techniques should be adopted to perform collectively to form a complete governance structure that aims to capitalise on the areas of expertise of each project team member and to minimise the incompleteness of each project task at hand, and in so doing, ensuring successful project outcomes (Wang & Chen, 2006).

2.3 Project success factors and governance

Project success factors can generally be referred to as those tools or levers available to management to utilise that can increase the chances of achieving successful project outcomes (Westerveld, 2003). Academics researching project management principles have recognised the importance of identifying the crucial success factors to all types of projects, but more importantly realised that with the increasing number of success factors, and their diversity, it was crucial to formalise them into applicable frameworks and to provide a clarification on the types of projects and understand the contexts these were relevant to (Baccarini, 1999; Shenhar, Dvir, Levy & Maltz, 2001). Success factor models have therefore been built and have evolved as more research is conducted in the project management field.

The most renowned success factor models, which initially include governance as a success factor, from which many newer models have evolved from are the models covering organisational effectiveness and technical validity created by Pinto, Slevin and Prescott

(Badewi, 2016; Joslin & Müller, 2016; Pinto & Prescott, 1988; Pinto & Slevin, 1988; Serrador & Turner, 2015). Researchers then modified these models to ensure that they factored in the required structure, grouping and context to mitigate any project risks (Shenhar, et al., 2001).

Building further on this research, it was shown that soft project success factors such as a cohesive team working together, the style of leadership as adopted by the team lead or manager, and the collective leadership style as conveyed by the team as a whole have a very important role to play in ensuring the success of the project (Hoegl & Gemuenden, 2001; Jugdev & Müller, 2005). In addition, the important association between the practice of benefits realisation management (a method for companies and entities to ascertain, pre and post project completion, to measure how projects can add valuable benefits to the organisation) and project success was proven by Serra and Kunc (2015). However, they did concede that classic benefits realisation management (BRM) practices on their own are insufficient in ensuring that projects are executed at the most effective level, and in agreeing with the earlier findings of Bryde (2005), tried and tested BRM practices should form a part of a more complete governance structure that incorporates other forms management and project methodologies in order to ensure or increase the likelihood of project and business success.

In specifically addressing the importance of the relationship between project governance and successful project delivery, specifically on projects that require a large amount of funding, such as a large-scale and sophisticated ERP system, Bekker and Steyn (2008) of South Africa carried out a qualitative case study which found a strong correlation from the interviewees of how certain governance principles had an effect on the project outcomes.

Furthermore, a study assessing the effect of numerous project management approaches on different projects types resulted in the conclusion that governance does not play a mediation or moderation role in the relationship between the project methodology chosen and the achievement of project success or failure, but rather plays the role of an antecedent variable, which is further indicative and in agreement with other related studies which conclude that good governance will span the entire project life cycle, and that an organisation's pre-existing stance regarding its orientation around stakeholder versus shareholder views and the level of strictness adopted from a controls based approach perspective have an effect on what approaches are adopted to company projects (Müller & Lecoeuvre, 2014).

This then lends to the assumption that the Stinchcombe and March (1965) theory can garner relevance in this situation as it attempts to prove that the culture and characteristics instilled in a company during the founding of that organisation that can have a direct influence on the

approach chosen to manage all subsequent tasks that the organisation takes on (Califf, Beaulieu & Martin, 2012).

Then, as summarised by Joslin and Müller (2016) and based on the teachings in the book by Van de Ven (2007) whom applies the cause and effect conditions as made famous by the 1800's philosopher John Stuart Mills and often referred to today as Mill's method or theory of causality, it is argued and suggested that are three distinct criteria that one can utilise in order to conclude that a cause and effect relationship may exist between certain independent and dependant variables. These criteria are defined by Van de Ven (2007) as the "covariation or correlation between presumed cause and effect; temporal precedence of the cause occurring before the effect; and absence of spurious factors that may confound the cause-effect relation" (p. 167). The second of the three criteria listed is understood to explain and identify the existence of time specific events or variables that occurred prior to, and are crucial to, the occurrence of another specific event.

Therefore, for the purposes of this study, it can reasonably be assumed that the methods by which a project is governed can represent the prior occurring variable that acts as a cause, and leads up to the specific event, being the successful outcome of a project. This assumption is dependent on the notion that the methods or culture of governance adopted within the organisation are created and implemented within the entity without specifically considering how individual projects may be governed within the organisation (Joslin & Müller, 2016).

If the above holds true, then this test of linking corporate governance to project governance and their influence on the potential successful outcome of projects satisfies one of the previously stated criteria of Mills (the philosopher) and the work of Van de Ven (2007). Namely the principles and standards of causality. The other criteria for determining if a causal association exists will be presented in Chapter 6 of this research paper, and the possibility of association between the methods of governing projects and the successful outcomes of projects will be scrutinised the in the concluding section of the paper.

In conclusion, organisational governance can be seen as enabler to achieving organisational success, and project governance can be classified as a success factor for projects. The above literature therefore points to the potential hypothesis that the project governance methods adopted on ERP projects is associated with that project's success.

2.4 Project success

The criteria to determine project success was historically based on the triple constraint theory, being the achievement of project milestones that are within cost, time and scope (Atkinson, 1999). However, there was a persistent acknowledgement amongst professionals and researchers in the project management space that this list of only three criteria was far from complete (ul Musawir et al., 2017). Importantly, this therefore has since evolved to include other important criteria such as the quality of the final product, the satisfaction of stakeholder needs, and knowledge management (Müller & Jugdev, 2012; Shenhar & Dvir, 2007).

Furthermore, certain exposed case studies brought to light in the work by Shenhar and Dvir (2007) have shown that the successful outcome of projects may be more complex than the simple binary construct of success versus failure, as it was shown that in a sample of high-scale projects where the project outcomes did not produce the intended benefits, they still proved to be successful in terms of becoming an effective investment.

Similarly, a project embarked on by an organisation that ends up producing the required deliverables within the original cost structure and adheres to the quality standards required from the final product, may not entirely be considered as a successful project if the investment does not yield the required benefits as first sought out when considering the necessity of the project (PMI, 2016).

All projects embarked on by organisations around the world will differ in scale, type, industry, and skills required, and therefore the criteria used to judge whether or not the project has been successful will differ from case to case, and will also differ depending on whether the opinion of the project owner, user of the project outcomes, or the team members is being used to determine success versus failure (Mir & Pinnington, 2014).

Shenhar at al. (2001) further insists that projects, and especially large-scale ERP projects, should be seen as strategic in nature and therefore their success or failure should be judged according to the project achieving its short and long-term objectives or not. Adding to this, it was debated in 2007 that the effectiveness of the work done by the core project team must be included as one of the many project success measurement criteria, and has since been utilised as such in many other studies thereafter (Mir & Pinnington, 2014).

Finally, it is also important to note that in deciding whether a project has been either a success or a complete failure can be argued or contested based on the context or the situation surrounding the business at the time (Jenner, 2015). For example, a project that is dropped

or cancelled prior to completion due to a change in the business environment or objectives cannot necessarily show that that specific project was a complete failure.

Therefore, in order to tackle the multifaceted and intricate components to project success, Andersen (2014) and Baccarini (1999) sought to break the concept of project success down into a model made of multiple dimensions. These two dimensions originally consisted of only project management success, which embodies the classic triple-constraint conditions for project success, and project product success, which focuses more on the approval or contentment enjoyed by the project owners, sponsors, and end-users of the project outputs due to the project meeting their strategical expectations and objectives (Baccarini, 1999).

Similarly to this, Zwikael and Smyrk (2012) took all past discoveries around the criteria for project success and proposed a triple-test performance framework which grouped these project success criterion into three distinct dimensions, namely, project management success, which rates project success based on the performance of the project manager as viewed by the project owner; project ownership success, which relates the project owners performance in achieving the business case objectives as decided by the funder of the project; and project investment success, which attempts to quantify the business benefits generated by the project from an investment perspective by the funder of the project (ul Musawir et al., 2017).

Arguably, the most comprehensive research into project success criteria was conducted by Khan et al. (2013) whom analysed the relevant literature on success criteria spanning the last four decades and created a consolidation of the most renowned models in the field. For this reason, the model of Khan et al. (2013) will be utilised for this research as it incorporates the latest research from the top researches in the field of project success.

The model provides a view of both hard and soft variables to measure possible project success. Examples of hard variables would include project completion according to specification and project completed on time, whereas soft variables may include project team satisfaction, or behaviour, and project learnings (Baccarini, 1999). The model groups all relevant success criteria into five dimensions that will help to assess the level of project success achieved or not achieved, namely project efficiency (based on the iron triangle criteria for project success), organisational benefits, project impact, stakeholder satisfaction, and future potential (Khan et al., 2013).

Appendix 1 lists the criteria for project success as proposed by of Khan et al. (2013). These criteria are utilised in the survey for this research in the form of questions, that have been amended slightly in order to be specific to ERP type projects, and seeks to ascertain from the

respondent whether or not the ERP project was successful. The criteria have been sorted to show under which of the five project success dimensions, mentioned above, the questions fall under.

In this research, project success according to the questionnaire respondents will be assessed to firstly ascertain as to whether the ERP project that the respondent was a part of was successful or not, and secondly, for project success's possible relationship with the project governance approach adopted, and then further evaluated as a dependent or antecedent variable with a contributory association in order to prove the general hypothesis for this research that the project governance methods adopted on ERP projects is associated with that project's success (Badewi, 2016).

2.5 Project governance

It is vital that an effective form of governance spans across all areas within an organisation and embeds itself in the culture of the organisation (Klakegg et al., 2008). Governance as part of an organisation's culture should begin with a robust corporate governance structure that expands from the board of directors and through to the management level to guide the execution of business tasks, and down to a project level of governance (Klakegg et al., 2008). Project governance should be aligned with the corporate governance approach adopted but must be more focused to the requirements of individual projects (Donaldson & Davis, 1991).

Project governance, according to (Pinto, 2014), can be defined as "the use of systems, structures of authority, and processes to allocate resources and coordinate or control activity in a project" (p. 383).

It is necessary to assess the history of literature regarding how different types of management theory have been applied to corporate governance as many of the theories have been used to build and apply to the concept of project governance (Müller & Lecoeuvre, 2014). Historically, the concept of organisational governance was reserved for the study of those in the field of law, then researchers within the field of economics began to delve into how companies make decisions and proved a connection between the governance approach adopted by a company and the financial and operational performance of that company (Gilson, 1996).

Researchers then began to take the relevant facets of management theory to assist them in comprehending and framing the aspects affecting the relationship between corporate governance and performance, and in so doing, identified the most applicable theories as being

agency, stewardship, stakeholder, shareholder and resource dependency theories, as well as the transaction costs of economics (Joslin & Müller, 2016; Yusoff & Alhaji, 2012).

Hirschey, John and Makhija (2009) argue in their book that one of the top drivers for using the theory of corporate and organisational management to decode the construct of governance was to better understand and advise organisations on the impact that substandard governance practices was having on causing the poor performance on companies, and how this impacts the shareholders. This issue was certainly valid as studies have shown that when organisations take steps to manage and resolve and problems associated with how they apply any corporate governance practices, then this has shown to steadily and dependably translate to a rise in shareholder value (Gompers, Ishii & Metrick, 2003).

Agency theory, made more renowned in the 1970's, takes an economic approach to explain the relationship between owners and shareholders of an organisation, and the management that they have employed by assuming that managers will behave in a rational yet self-interested way (Jensen & Meckling, 1976). Agency theory has been applied by the top researchers to topics covering a vast number of fields, including accounting, economics, finance, marketing, political science, organisational behaviour, and in relevance to this study, it has also been applied to corporate governance and project governance (John & Senbet, 1998; Turner & Müller, 2003).

Agency theory suggests that company managers acting as agents for the shareholders will exercise their given control over the resources that they are responsible for in an opportunistic manner to chase goals and objectives that may not be in the best interests of the shareholders (referred to as the principal within agency theory) (Jensen & Meckling, 1976). The misalignment between the interests of the shareholder (principal), and the actions of management or project management (agent) is caused by information bias as the manager or project manager usually has more or higher quality information than the shareholder or project sponsor due to the manager's proximity to the activities of the company (Wiseman, Cuevas-Rodríguez, & Gomez-Mejia, 2012).

Proven in the work by Poblete and Spulber (2012), this difference in information supply can perpetuate an increase in moral hazard risk, being the risk that the agent may not act in good faith, may mislead the principal, and may now be enticed to take on extra risk in order to look after their own self-interests, thus swelling the agency effect if not this risk is not managed.

Possible solutions to this issue include bonus incentives and contracts to motivate management to conduct themselves rationally, in the best interest of the owners or

shareholders, and in accordance with company principles through a structured and controlled form of governance that seeks to mitigate any risks associated with agency theory (Müller & Lecoeuvre, 2014). For the purposes of this research, agency theory is thus used to explain the facets and favouring of a shareholder and behaviour controlling governance structure.

Jensen and Meckling's (1976) adaptation of agency theory in the light of modelling the agent to principal dynamics has not been without controversy. Wiseman et al. (2012) argues that the above theory has been oversimplified in the utilitarian sense and fails to incorporate the widely acknowledged findings that the dynamics of the principal agent relationship and behaviour are different depending the individuals concerned, and heavily dependent on the social, organisational, and industrial contexts that they find themselves exposed to.

In reply to the widespread criticism that agency theory attracted based on the generalisability of agency theory, stewardship theory was formulated in order to provide a psychological view of the concept of governance by stating that the agents, being the managers and project managers for the purposes of this research, are stewards whose motivations and goals are more in line with the objectives of the shareholder and corporation as a whole, which represents a wider stakeholder approach, rather than the managers own immediate self-interested and utility maximising goals (Donaldson & Davis, 1991).

The steward is said to be different from the agent in that the steward can be trusted and adopts the decision-making approach whereby the best interests of the company are at the forefront of their mind, whereas the agent needs to be motivated and controlled into this type of behaviour (Davis et al., 1997). It is argued that this type of behaviour, stewardship behaviour, and the focus on an intrinsic source of motivation rather than an extrinsic source, and therefore a stewardship type of behaviour is more relatable to the upper levels (love / belonging, esteem, and self-actualisation) of Maslow's (1970) hierarchy of needs (Davis et al., 1997).

Stewardship theory is not without criticism from the academic world as Pastoriza and Ariño (2008) argue that stewardship theory views the organisation using a static approach and does not factor in the possibility of members within the organisation whom adopt a steward type management style falling back into an agent type philosophy when their careers or achieved levels within the company may come into threat. For the purposes of this research, stewardship theory is thus used to explain the facets of a stakeholder and outcomes controlling governance approach to management.

It is argued that when comparing agency and stewardship theories against each other, one cannot assert that each may be more credible than the other from a general standpoint, but

rather that each may become more valid depending on the context in which it is being applied (Davis et al., 1997). Both theories attempt to explain the relationship between shareholders, stakeholders and management, and thus can be seen to be task related or project level theories, and are reinforced by their related organisational theories of shareholder and stakeholder theory (Joslin & Müller, 2016). Therefore, this study will explore some of these dynamics that determine in which contexts or circumstances show that agency theory or stewardship theory could be the most beneficial from a project governance and project behaviour point of view.

Other theories that need to be mentioned are those of Transaction cost economics and resource dependency theory, as Caldwell (2004) explains that when any of the aforementioned theories are utilised within an organisation, it has dramatically assisted in raising the standard of corporate governance inherent in the entity, as well as cementing a culture of virtuous ethics and sound moral decisions. Transaction cost economics theory implies that entities that adopt a governance structure that most suits the situation of the transaction or project at hand, can attain the least expensive and most efficient transaction costs (Williamson, 1979). Whereas resource dependency theory, as explained in the book by Pfeffer and Salancik (2003), describes that managers or project managers are capable of prioritising both internal and external staff and resources in order to attain the aims and objectives as required by the organisation.

In relation to this study, and to focus the literature review more towards projects and ERP projects, Müller, Pemsel and Shao (2015) indicate that within the space of project management there are three main parts to establishing the overall concept of governance, namely, project governance, the “governance of individual projects” (p. 841), and the governance of projects, the “governance of groups of projects, such as portfolios” (p.841) or programmes. These two main areas of governance for projects are also directly in line with how the Project Management Institute defines, in their view, how the governance of projects, programmes, and a portfolio of project should be managed and structured (PMI, 2016).

Previous studies show a diverse range of possible governance approaches to utilise when creating a project governance structure (Müller et al., 2015). Too and Weaver (2014) provided “guidance to organizations in the development of effective project governance to optimize the management of projects” (p. 1382). Müller et al. (2013) investigated “the variety of ethical decisions of project managers and their impact from corporate governance and project governance structures”. Sanderson (2012) discussed the “different explanations for the performance problems exhibited by many megaprojects, and examines the proposed

governance solutions" (p. 432). Weill and Ross (2004) built upon their conviction "that IT governance is the most important factor in generating business value from IT" (p. vii). And finally, Pinto (2014) sought to "consider how normalization of deviance affects project management practices" (p. 376).

In addition to this, this research on project governance has made specific use of the same management theories that have been utilised in research around the field of corporate governance (Biesenthal and Wilden, 2014). Yet there are only a couple studies that have been able to provide a system that categorises governance principles and the context it is utilised in.

The amount of quantitative research into the link between project governance and successful projects is said to be quite incomplete (Serrador & Turner, 2015). However, there are a couple studies of interest conducted into project governance and project success within the IT, and whilst an ERP system can be implemented at any organisation regardless of the industry, it is, at its core, an Information Technology product. These studies include Wang and Chen's (2006) research into ERP implementations and particularly how the problem of interfirm governance (as a large-scale ERP implementation is generally carried out by one to four firms for one specific client) can influence the successful outcomes of the project. They found that if an equilibrium can be reached around specific governance factors such as trust between owners, sponsors, mangers, and project team members; the existence of explicit and implicit contracts; and the reputations of all firms involved; then these instruments will have an effect on the project outcomes (Wang & Chen, 2006).

Furthermore, a separate study by Müller and Martinsuo (2015) explained the influential part that the governance structure around a project can play in effecting the behaviours and attitudes of interfirm project participants and how this effects the outcomes of the project. In a study released in the same year, Joslin and Müller (2015) also acknowledged that project governance acts as both an antecedent and a moderator on the path to project success, but ended up concluding that governance holds an indefinable role within the link between the project processes followed or methods used and the successful outcome of the project.

From a qualitative point of view, with a focus on South African organisations, identical to this research study, Bekker and Steyn (2008) complimented these later studies as mentioned above by confirming the existence of governance being a precursor to organisation and project success. When looked at together, the studies of Wang and Chen (2006), Müller and Martinsuo (2015), Joslin and Müller (2015), and Bekker and Steyn (2008) indicate that their conclusions display differences in the preciseness of the part that governance or project

governance has to play in its relationship to project success, and therefore, this study seeks to provide more information and evidence in this field of study.

This particular research study will leverage off the model of the four types of governance principles as explained by Müller (2009). This framework contains the two paradigms to be tested and expanded on in this research, namely, the dimension that will talk to the organisation's stance and approach to corporate governance, and thus to how individual projects are governed, based on the organisation's orientation regarding a stakeholder versus shareholder approach (Clarke, 1998). The second-dimension attempts to address the level of control behaviour practiced by the company, where it must be determined if the organisation takes a more behaviour control type of stance, by strictly following processes, or an outcome control stance, by simply meeting business and project expectations (Brown & Eisenhardt, 1997).

This model and the two selected paradigms of governance have been chosen for this research due to as it is suited to a range of projects but is particularly applicable to large-scale projects such as ones bearing a high monetary cost, including ERP related projects and implementations, and their relation with the project governance approach taken by any organisation, regardless of the industry in which they operate in, and project success (Müller & Lecoeuvre, 2014).

As described in this chapter, the top studies within the fields of governance, corporate governance, and organisational performance have shown the existence of a connection between the methods used to govern an organisation, and whether or not that organisation is successful or not. Renowned research has shown that organisations that do not have the rigid and relevant governance structures in place will experience more serious issues with regards to exacerbating the negative effects of agency theory in how managers or staff behave, which leads to undesirable corporate performance (Becht, Bolton & Röell, 2003; Hirschey et al., 2009). Furthermore, Hirschey et al. (2009) have shown that an increase in the rights and involvement of shareholders in the organisation will have a helpful effect on how the company performs. Whilst Bhagat and Black (1999) showed in their research that an increase in the level of independence that a board of directors has will most likely translate to better overall performance by the company.

These discoveries, findings, and assumptions therefore supports this research as it is accepted that the governance structure within an organisation must go before, and in many instances, provide the recipe for, the success of the entity. This confirms the previously mentioned research of Biesenthal and Wilden (2014), and also that of the writings of Turner

(2016) whom also stresses the importance of proper project governance structures and methods to ensure successful project outcomes. These notions are further expressed and confirmed by, as previously mentioned, the quantitative studies into governance and project success by Joslin and Müller (2015), and the Information Technology projects study by Wang and Chen (2006). Therefore, it is hypothesised for the purposes of this research that the project governance methods adopted on ERP projects is associated with that project's success.

There is only one prevalent study, done by Joslin and Müller (2016), on examining if the governance method chosen by an organisation, that favours either the shareholder or the stakeholder approach to governance, can have a direct influence on whether or not projects executed within that organisation are successful or not. The study by Joslin and Müller (2016) concluded that an organisation's choice of whether they favour an agency or stewardship approach to governance will have a slight, yet important relationship with the successful outcomes of projects executed within the entity. However, their research was quite broad in the fact that they studied any and all types of projects around the world, without any focus on type of project or industry. This study explores the relationship between project governance and project success on ERP projects in the South African corporate context.

The notion of an entity that favours a shareholder approach indicates that the organisation favours the interests of pursuing objectives that ensure the maximisation of shareholder value or wealth over the interests of other stakeholders (Clarke, 1998).

In order to clarify the concept of stakeholders, this research accepts the definition presented by Freeman, Harrison, Wicks, Parmar, and De Colle (2010) of stakeholders where they are referred to as any "groups or individuals who can affect the organisation" (p. 48). More specifically, stakeholders of an organisation can be typically grouped and listed as the owners, shareholders, employees, customers, suppliers, creditors, government, and the community.

Bebchuk, Cohen and Ferrell (2008) explain that in the cases where an entity takes the stance of favouring its shareholders views and need over the general stakeholder community, then this is referred to as the company taking an internal view of that organisation's main reason for existence and operation. Whereas, when an organisation favours more of a stakeholder-oriented approach to their operational and governance structures, they are then said to taking more of an external view of that organisation's main reason for existence and operation (Bebchuk et al., 2008).

This more external type of view sees the organisation bear in mind all the different possible stakeholders that can be affected by any decision that the entity undertakes, and will seek to counterbalance the needs and wants of the different stakeholder groups whilst attempting to achieve their organisational goals and objectives (Ansoff, 1965; Freeman et al., 2010).

The academic research on project management has shown that taking into account the interests of the relevant stakeholders to a particular project is a highly important factor in the entire project process that ultimately determines whether that project is successful or not (Eskerod & Vaagaasar, 2014).

It is common practice, and an important duty of project managers to treat a range of stakeholders as the eventual and definitive beneficiaries of the project outcomes, and will therefore prioritise the approval and satisfaction of theses stakeholders as a crucial project success factor (Eskerod & Huemann, 2013).

Müller and Turner (2007) reiterate this point in their research findings when they discovered that the achievement of high levels of approval and satisfaction of the relevant stakeholders in relation to the project at hand was regarded as the most important of any possible project success criteria by the surveyed project managers in the United States of America. In addition, stakeholder satisfaction in areas outside of the United States of America was consistently ranked by the project managers as being in the top ten of most crucial project success factors to consider (Müller & Turner, 2007).

In light of the above, the overall research hypothesis for this dissertation must be broken down further into:

Hypothesis 1: A project governance process that favours a stakeholder approach has a positive relationship with successful project outcomes.

Correspondingly, the academic literature on project management and project success is undecided in regards to the exact association between the method of control (i.e.: a behavioural control orientation versus an outcomes or results-based orientation) and the likelihood that the project will be successful or not.

Evidence of this, firstly comes from studies done into project management models, maturity levels, performance and tools, as conducted and published by the Project Management Institute (PMI, 2013), and is complemented by the research conducted into the governance mechanisms and methods used on high value and large-scale projects, such as the work of

Müller and Lecoeuvre (2014), and Klakegg et al., (2008). These research examples all highlighted the notion and significance of having strict controls and to rigorously follow the proven project management processes to ensure project success.

However, there are other research examples that paint a more varied picture. The research conducted by Petit (2012) who showed that due to the dynamic and ever-changing environments experienced by corporations and organisations in the last couple of decades, entities embarking on important projects need to be alert and have the capability of switching between different project management structures based on the situation and uncertainties faced by the project team or the organisation as a whole.

Furthermore, the study by Turner and Müller (2004) on analysing the different behaviour styles between project owners and project managers, where they conclude that when projects are strictly controlled through processes, methodologies, and guidelines, then these structures must find the correct equilibrium between being too focused on the processes to be followed, implying a behaviour controlled form of governance, and being too free in leaving project team members to do as they please with a reliance solely on their experience and expertise to get the job at hand done. A method of project governance that is either too behaviour-controlled focussed or too outcomes based focused, will both result in project failure (Joslin & Müller, 2016).

These studies above that focus on how the controls, processes and behaviour of the project team are governed, all indicate a relationship between the methods and structure of how projects are governed and the likelihood of project success. There is also the understanding that project management as a business process and as a field of study has evolved to become a very process driven and controlled task undertaken by organisations (PMI, 2013). Adding to this notion is the growth in popularity over the last two decades of many new types of process driven forms of project management, such as agile and scrum (Serrador & Pinto, 2015). The final hypothesis of this study is therefore:

Hypothesis 2: A project governance approach that favours behavioural and strict process control will have a positive relationship with successful project outcomes.

2.6 Conceptual framework

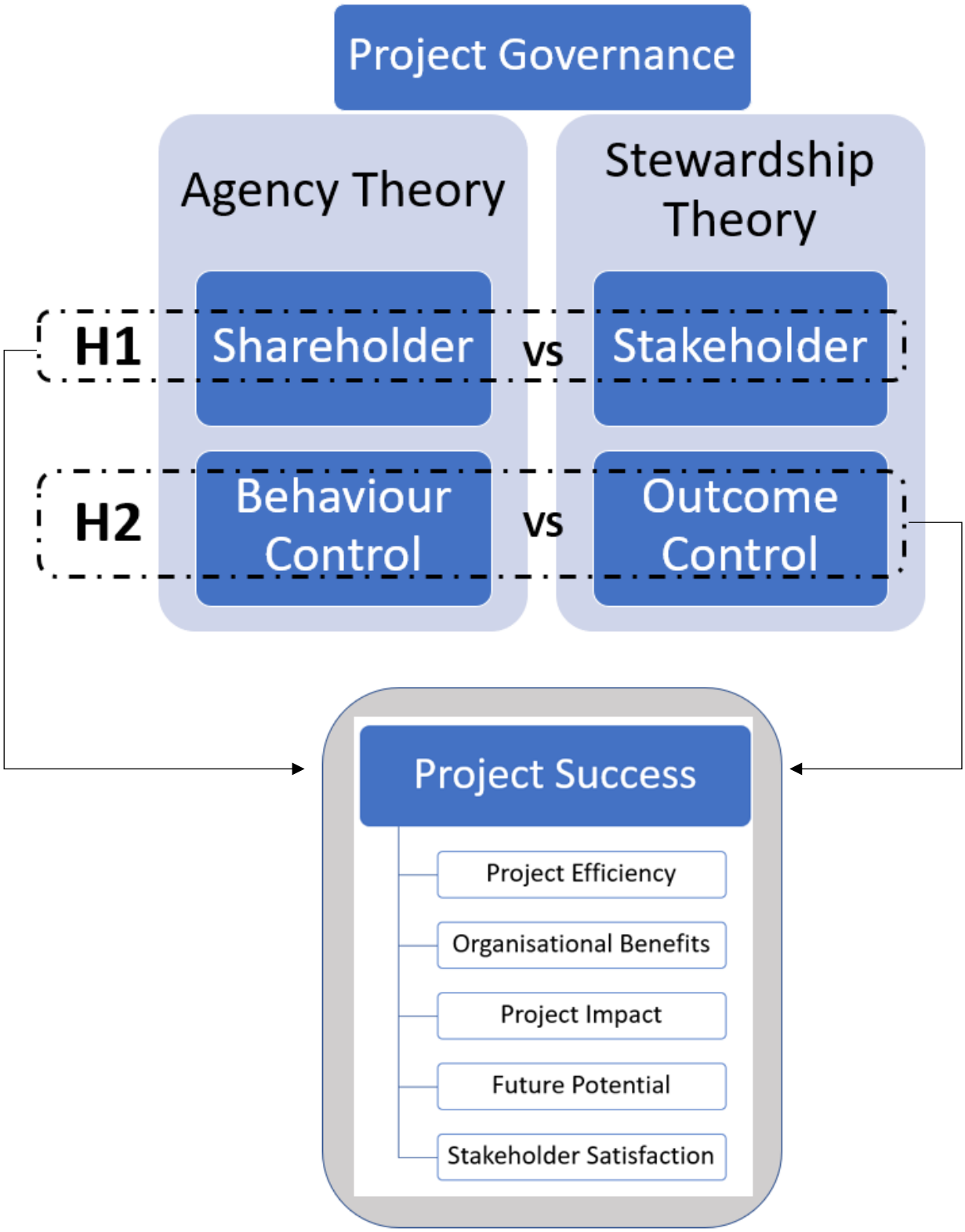

Figure 1. Conceptual framework

Figure 1 above displays the conceptual framework that is based on the theoretical grounding of agency and stewardship theories used as a lens for this study, as well as the insight provide from reviewing the academic literature giving foundation to the three constructs of project governance that is shareholder od stakeholder oriented, project governance that process controlled or is based on project outcomes, and ERP project success.

Müller and Lecoeuvre (2014) operationalised an established model for the governance of projects and categorised into four separate possible paradigms that can describe the high-level approach that an organisation or project has adopted in terms of its governance methodology. Accordingly, these four paradigms describe that a project governance methodology can contain a mix or a balance of elements that indicate that the project governance orientation either favours a shareholder or a stakeholder approach, and that the project governance controls structure is either focused on strict controls or is more focused only the project outcomes.

The perspectives of agency and stewardship theories have been used in this research as proxies in explaining the behaviour dynamics of project management and team members when a certain project governance methodology is in effect. Either end of the scale for project governance orientation or project governance control represents a type of project governance behaviour or control structure that can be attributed to the views of agency theory or stewardship theory.

Agency theory is represented by the project governance orientation that is more favoured towards the interests of the owners or shareholders, and a project governance control structure that is strictly managed to ensure that contracts and processes are in place to enable self-serving actions of management staff that seek to maximise shareholder value (Fama, 1980; Joslin & Müller, 2016).

Contrarily, stewardship theory is operationalised in the research to represent the project governance orientation that is more favoured towards the interests of all relevant stakeholders, and a project governance control structure that is based on trust, and the management of project outcomes is utilised as the mechanism to accomplish the project and organisational goals through a balanced approach of satisfying the needs of an assorted group of stakeholders (Müller, 2009).

The ERP project success construct as contained in the conceptual framework for this research is based on the project success factors, and project success dimensions as outlined in the research of Khan et al. (2013).

The academic research contained within section 2.5 of this review indicates that organisational governance determines project governance structure, and that project governance has an influence on project success (Becht, et al., 2003; Biesenthal & Wilden, 2014; Turner, 2016; Wang & Chen, 2006). Project governance can be broken down into its orientation (shareholder versus stakeholder) and its method of control (process & control versus outcomes) (Müller & Lecoeuvre, 2014). The two project governance paradigms will be tested in isolation to ascertain if either of them has a significant correlation with project success.

H1 in the conceptual model represents the project governance orientation paradigm in which the methodology applied favours shareholder thinking (agency theory) or stakeholder orientation (stewardship theory). It is hypothesised in this research that project governance orientation is significantly correlated with ERP project success (Eskerod & Huemann, 2013; Joslin & Müller, 2016; Müller & Turner, 2007).

Similarly, the H2 section in figure 1 represents project governance control paradigm where project processes and controlled are strictly managed (agency theory) or solely focused on the achievement of project outcomes (stewardship theory). The second hypothesis in this research dictates that the scale of project governance process control is significantly correlated with ERP project success (Klakegg et al., 2008; Müller & Lecoeuvre, 2014; Petit, 2012; PMI, 2013; Serrador & Pinto, 2015; Turner & Müller, 2004).

2.7 Conclusion

The academic literature provided a thorough analysis of project governance and ERP project success. ERP project are highly complex and expensive to execute, yet are necessary to embark on due to the proven potential business benefits that they can yield (Baykasoğlu & Gölcük, 2017). In addition, the risks that these high-profile projects may not be implemented completely and successfully is high (Zhu, Li, Wang, & Chen, 2010). Therefore, ERP projects should be taken very seriously by any parties involved in the project, and if a method by which that project is governed can have an impact on the end results of a project, then the appropriate governance structure must me formed and followed (Wang & Chen, 2006).

Many tools and methodologies are available to project teams to help mitigate project risks and increase the chances of them being successful. One such tool is project governance (Westerveld, 2003). However, in order to assess if project governance is a suitable and significant tool, the ERP project must first be assessed as to ascertain as to whether it was successful or not, and that can be achieved by examining the specific criteria and dimensions that determine project success (Khan et al., 2013).

The literature further showed that project governance can be made up of a number of different facets and approaches, however using the theoretical underpinning of agency and stewardship theories, project governance can be separated into four paradigms that label governance as either shareholder oriented, stakeholder oriented, process controlled, or outcomes based (Müller and Lecoeuvre, 2014).

The literature guided the researcher to be able to form a general hypothesis that dictating that the project governance methods adopted on ERP projects is associated with that project's success (Biesenthal & Wilden, 2014; Joslin & Müller, 2015; Turner, 2016; Wang & Chen, 2006). However, in order to make it more specific, project governance has been broken up into its two paradigms of orientation and control so that two specific hypotheses could be formed, as described in the next chapter.

A comparative evaluation of the concepts discovered through this literature to the research findings made using data is conducted in chapter 6 of this study. The chapter compares what commonalities exist, and what can be disputed. Chapter 6 and 7 also describes how the findings of the research can contribute to existing literature and what areas need further attention.

3 Hypotheses

In reference to the literature review in the previous chapter, this research will seek to prove the hypothesis that states that project governance correlates with project success (Badewi, 2016; Joslin & Müller, 2016; Serrador & Turner, 2015). This study focuses specifically on ERP projects, and due to the fact that an ERP implementation or related project meets the precise and widely accepted definition of a project, as per the Project Management Institute (PMI, 2013), it therefore follows that any academic literature and studies conducted within the field of project management will also apply to ERP projects.

Top research in the areas of project management and governance have indicated that governance or corporate governance structures within an organisation are established prior to the setting up of project governance methods to be used, and have a direct influence and say on these methods. The research has also shown that there is a moderating and an antecedent relationship between project governance and project success (Becht et al., 2003; Bhagat & Black, 1999; Biesenthal & Wilden, 2014; Hirschey et al, 2009; Joslin & Müller, 2016; O'Sullivan, 2000; Turner, 2016; Wang & Chen, 2006). The overall hypothesis for this research is thus:

Research hypothesis: The project governance methods adopted on ERP projects is associated with that project's success.

This will be tested by breaking this hypothesis into two related research questions and their relevant hypotheses, namely, does a stakeholder-oriented approach to project governance on ERP projects positively relate to project success, and does a behaviour and process-controlled approach to project governance positively relate to project success.

By delving deeper into the smaller nuances surrounding the concept of project governance, the literature has revealed that a stakeholder-oriented approach to corporate governance and project governance should have a positive influence on the success of the company and of their projects (Clarke, 1998; Eskerod & Huemann, 2013; Eskerod & Vaagaasar, 2014; Joslin & Müller, 2016; Müller & Turner, 2007). It is therefore hypothesised that:

Hypothesis 1: A project governance process that favours a stakeholder approach has a positive relationship with successful project outcomes.

Null Hypothesis: H_0: There is no statistically significant positive relationship between the stakeholder form of project governance and project success.

Alternate Hypothesis: H_1: There is a statistically significant positive relationship between the stakeholder form of project governance and project success.

Furthermore, in contrasting the opposing methods to project governance in terms of whether the corporate and project governance methods favour either a process and behaviour controlled orientation or an outcomes based orientation, the literature has arguments to justify the benefits of both methods, but overall seems to favour and imply the popularity of the behaviour controlled orientation (Joslin & Müller, 2016; Klakegg et al., 2008; Müller & Lecoeuvre, 2014; Petit, 2012; PMI, 2013; Serrador & Pinto, 2015; Turner & Müller, 2004). It is therefore hypothesised that:

Hypothesis 2: A project governance approach that favours behavioural and strict process control will have a positive relationship with successful project outcomes.

Null Hypothesis: H_0: There is no statistically significant positive relationship between the process / behaviour-controlled form of project governance and project success.

Alternate Hypothesis: H_1: There is a statistically significant positive relationship between the process / behaviour-controlled form of project governance and project success.

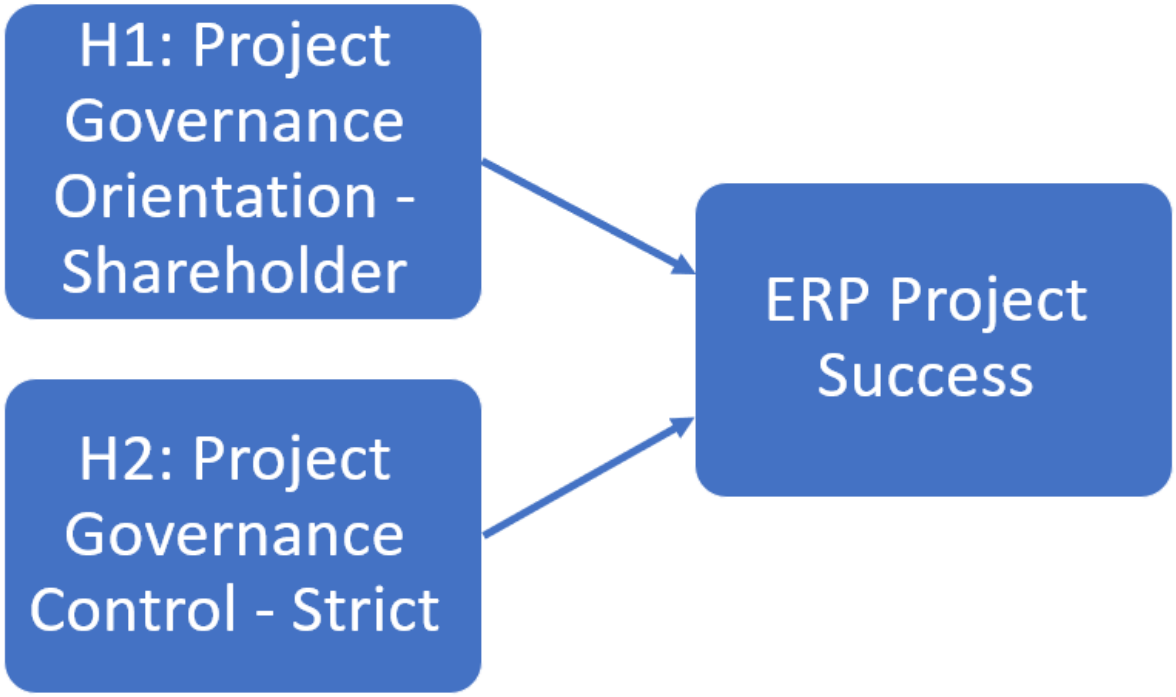

Figure 2. Hypothesis tree

4 Research methodology

4.1 Introduction and research philosophy

This chapter will describe the design and strategy used in this research to ensure that the relevant objectives of this study are achieved.

The study will aim to determine if a relationship exists amongst different approaches to project governance on ERP implementations and project success. In an effort to prove this, the choice of research methodology was predominantly guided by the processes outline by Saunders and Lewis (2018). A post-positivism philosophy will be adopted within the research as the study will require an objective stance, yet an awareness of the possible subjectivity that may arise from the participants whom data will be collected from. The purpose of a post-positivism approach is to identify trends in the data, rather than sweeping generalisations (Biedenbach & Müller, 2011). The positivism aspect of the philosophy chosen for this research also allows for the examination of the evidence gathered in order to determine if a correlation exists amongst the variables to be studied (Oliver, 2013).

The rest of this chapter will discuss the research methodology and design, population, unit of analysis, sampling method and sample size, measurement instrument and data collection tool, data gathering process and collection method, data analysis approach, research ethics, and limitations of the research.

4.2 Research methodology and design

A deductive approach was followed in this research as existing theory and research was tested and applied to the research question of whether or not a relationship exists between specific styles of project governance and ERP project success at large South African corporations (Bell, Bryman & Harley, 2018). A deductive approach will guide the process of collecting data for the purpose of testing it and help explain causal relationships between the tested variables (Saunders & Lewis, 2018). The deductive method will also provide for a strong research design that will incorporate both the existing theory and any new observed evidence that may arise (Saunders & Lewis, 2018).

A mono method of quantitative research is the methodological choice for this research as, along with an in-depth review of current literature surrounding the topic, only one technique will be used for the collection of data, which will be via a survey in the form of an electronic

questionnaire sent to the relevant participants who work with, and have played a fundamental role in implementing, a sophisticated ERP system (Saunders & Lewis, 2018).

The purpose of research design of this study is descriptive in nature as it aims to produce an accurate representation of the opinions on how ERP projects were run, executed and experienced as expressed by the relevant persons on certain events and situations (Saunders & Lewis, 2018). A descriptive study is appropriate as “what”, “how” and “why” questions will be posed in the form of an electronic questionnaire, as was done in similar and acclaimed studies that utilise a questionnaire to judge project success in general and in relation to ERP projects, such as the research done by Wang and Chen (2006) and Joslin and Müller (2016).

The strategy for this research will be in the form of a survey. This research strategy involves the structured collection of data from an ample sized population (Saunders & Lewis, 2018). This will be achieved in the form of an electronic questionnaire comprising a set of standardised questions gathered from studying past research on the ERP topic, specifically following on from the set of questions generated from the work of Müller and Lecoeuvre (2014).

From a techniques and procedures perspective, the previously mentioned online questionnaire was developed and electronically sent to selected potential respondents in order to gather data for this research study, and according to Saunders and Lewis (2018), when a questionnaire is utilised, this is often referred to as a structured interview. A questionnaire is one of the most frequently used and a very reliable way of gathering data that is not directly observed by the researcher (Swanson & Holton, 2005).

The time horizon to suit the type of design of this research will be cross sectional. Cross-sectional research data is taken at a specific point of time and therefore represents a “snapshot” of current thinking around the topic from ERP users and industry experts representing an array of different ages, genders, experience and levels within a corporation (Saunders & Lewis, 2018). The fact that the survey was responded to by each respondent only once, as each respondent was required to provide their initials in order for the researcher to identify any duplicate survey responses, is further indicative of cross-sectional research (Saunders, Lewis & Thornhill, 2009).

Due to the limited time period that the research was conducted over, and to be realistic, this research had to be cross-sectional. Consequently, by being cross-sectional, this study does not take into account the capacity of the survey respondent to change their perspective over on the ERP project being questioned on in the questionnaire.

4.3 Population

The data was collected via a questionnaire sent to and answered by the relevant users and implementers of specific and sophisticated versions of an ERP system at large South African organisations. These particular individuals were targeted for this research because of their involvement and insight into the benefits, complexities, and challenges that are characteristic of a large-scale ERP implementation. Only projects, and thus the people involved with them, embarked on at larger corporations were considered as the research aimed to focus on large and intricate projects, and it is widely acknowledged that ERP implementation at large corporations will fit this description.

These users and implementers of the ERP system will consist of a mixture of clerks, who capture data onto the system daily; super-users, who have a high level of knowledge on how processes, or a set of integrated processes, function on the system, are usually required to analyse and report on system data, suggest system changes, report errors, and could be an internal employee or external consultant; and management, who are either in, or head of, departments responsible for a significant portion of cost of the system, or heavily rely on information produced from the ERP system to make decisions. In addition to this, the survey respondent must have been involved in the ERP implementation or related project in some capacity.

The population refers to a collection of individuals, things, and cases, and are the research units that need to be investigated thoroughly (Garg, 2016). Therefore, for this research, the population is any of the above-mentioned individuals working with the ERP system at or for a large South African organisation, which includes companies and government institutions.

This group of participants are hopefully be the most relevant to this research as they have day to day experience of the benefits and frustrations associated with the system and have ERP implementation experience, as opposed to exclusively surveying the ERP service providing companies and their employees who may be biased towards the system benefits. Limiting the population to individuals directly involved in, and with detailed knowledge of all aspects of a project's stages and outcomes, rather than also including individuals who had a vague knowledge of a project's on-goings, should make the population more relevant to this research, as well as ensuring that the population remains more homogeneous which will help to provide the least amount of variation in the data gathering methods.

4.4 Unit of analysis

A unit of analysis can be described as the object that is being studied as part of a research process. This object therefore attempts to point to the “what” of the research, that is the object, phenomenon, entity, process or event that s to be investigated (Mouton, 2001). The unit of analysis for this research project is thus the individuals directly involved on an ERP implementation project who were surveyed in order for the researcher to explore if there is a correlation between project governance and project success as perceived by the relevant users and managers of ERP systems at large South African corporations.

4.5 Sampling method and size

A sampling frame is a complete list of the members in the population relevant to the research (Saunders & Lewis, 2018). A sampling frame for this study is not practical to collect as this would require that every large corporation in South Africa using a sophisticated ERP system would need to be identified, then these corporates would be required to populate a list containing all employees that work with and rely on the ERP system in order to perform some part of their work. Along with this, a list of all staff members at every ERP service providing company would need to be collated and contain the list of all these staff that have been involved on an ERP implementation project.

Therefore, according to Saunders and Lewis (2018), the fact that the development of a sampling frame is impractical in this case, then a probability sampling technique cannot be used, but rather a non-probability sampling method should be adopted. Sampling in this manner makes it possible to generate results and responses that are representative of the entire possible population but at reduced fee.

Within the non-probability sampling realm, a number of different techniques are available when a complete list of the population to be studied cannot be compiled (Saunders & Lewis, 2018). The sample for this study was reached by collaborating with two top ERP service provider companies operating in South Africa, and eight South African corporates that operate a large-scale ERP system. Both of which the researcher of this study has worked with or has access to. Account Managers working at either of the two ERP providers are responsible for managing the relationship between the provider and the large corporate client, and the products, services and ERP consultants provided to the customer. The company executives in charge of these account managers were approached to provide a list of their large corporate customers, and the relevant account managers in charge. Account managers were contacted either telephonically, via email or in-person and requested to pass on the electronic questionnaire

on the researcher's behalf directly to employees or consultants at the targeted client, or to department heads at the client who can forward the survey onto their relevant employees that fit the criteria, mentioned earlier in the description of the research population, of working directly on the ERP system. Heads of departments working with ERP at the eight corporations referred to above were contacted directly by the researcher, and again, the survey was forwarded onto the relevant staff.

The number of different corporate clients that the ERP service providing company's account managers are responsible for, and managed to distribute their survey within, is quite considerable. This allows for a diverse range of opinions to be gathered from individuals exposed to different corporate environments, with different cultures, and therefore, different styles and structures of corporate governance which should have an effect on how project within those organisations are governed, and whether the ERP projects executed in the entities are successful or not.

The above non-probability sampling method is indicative of purposive sampling as it requires a deliberate decision to be made on the respondents to be selected based on very specific qualities inherent in them (Tongco, 2007). In this case the inherent quality is having worked on and with the ERP system and is indicative that the purposive sampling is homogenous in nature (Saunders & Lewis, 2018). The use of the purposive sampling method helps to safeguard the requirement of this research that the survey respondents are a representation of the target population.

Tongco (2007) further explains that the purposive and homogenous method should provide a minimum amount of variation in the data, and therefore any apparent differences in opinion amongst the respondents can be analysed further. However, for this research, any major differences in opinion between respondents with different job titles (manager, consultant, clerk, etc.) are highlighted and explored.

Saunders and Lewis (2018), do not make reference to how many respondents are required for the purposive sampling method using questionnaires, they only advise on the recommended number of interviews. However, Bernard (2002) indicates that there is no limit to the number of respondents required, as long as the needed information can be gathered. Through the purposive non-probability sampling method conducted by the researcher, and between the list of possible respondents generated by the account managers and the researcher in their private capacity, a list of around 800 potential respondents was generated, and the survey s were electronically distributed to them. As per the suggestions of Galesic and Bosnjak (2009) whom indicate that a 1 in 4 response rate should be expected for a web

survey that is somewhat short in length, such as the questionnaire utilised for this research. Therefore, the initial estimates were that between 150 and 250 responses could be obtained.

The survey received 166 usable responses, which is considered above the number needed of around 96 responses as indicated by Weiers (2008). However, due to some of the surveys being test runs, and with some of the respondents leaving out one or two answers, not all resulting surveys could be utilised for this research. There were no follow up emails sent to the original targeted responders to the survey as a follow up mail has been shown to not have any significant effect on improving the response success rate (The demographics of the sample of responders to the survey will be shown in chapter 5.

4.6 Measurement instrument

Along with this research being a quantitative and descriptive study, a survey in the form of an on-line questionnaire was used as the measuring instrument to collect data from the respondents. A questionnaire is a data gathering method where each recipient of it is required to answer identical questions in an identical order (Saunders & Lewis, 2018). The use of a questionnaire will provide the opportunity for the researcher to apply an objective approach in gathering the opinions, beliefs, insight, knowledge, and behaviour of the respondents on the research problem in question (Boynton & Greenhalgh, 2004).

The questionnaire has four main parts to it. Section one of the survey is a prelude and contains a general introduction to the research study and also an online consent form. The rest of the first section contained questions relating to the demographics of the respondents. This demographic information was firstly used by the researcher in order to exclude certain respondents from the research if they did not meet the research criteria. Fortunately, no respondents were excluded due to not meeting the criteria.

The rest of the questionnaire is designed to collect data from each of the respondents on each of the three main constructs to be studied within this research. The three constructs being, a stakeholder versus shareholder approach to project governance, a behaviour and process controlled versus outcomes-based approach to project governance, and project success. The structure, order, and method by which the questions were set up in each section was tested via a pilot questionnaire to ensure that respondents were not being influenced and skewing their answers in anyway (Saunders & Lewis, 2018). The questionnaire also followed the recommendations from Sekaran and Bougie (2016) to help guarantee that the wording, criteria and scales are consistent and clear, and by following the suggestions of Podsakoff, MacKenzie, Lee and Podsakoff (2003) so that the impacts of common method bias are

avoided. In addition, the survey includes confirms the anonymity of respondents in the survey's introduction, utilises different scales and layouts, the questions have been ordered randomly, and the constructs were tested using the Harman method.

In terms of validity and reliability regarding the creation of the questionnaire, validity simply refers to the notion that the finding or results gathered through the measurement instrument must be assessed to determine whether or not they are about what they appear to be about (Saunders & Lewis, 2018). As the purposive sampling method is being used for this research, validity should be ensured as very specific respondents are being targeted that have specific knowledge and experience regarding the topic at hand. Reliability of the research also needs to be ensured in order to produce consistent findings. This was possible through the data collection method of an online questionnaire as the same results should be produced if the same questionnaire is used on other occasions, other researchers should produce similar results, and those scrutinising this research should logically see how the conclusions were reached from the data collected (Saunders & Lewis, 2018).

Table 1
Questionnaire summary

	Information Tested	**No. of Questions**
Section 1	Consent Form and Demographic Data	12
Section 2	Project Success	32
Section 3	Governance - Shareholder vs Stakeholder	5
Section 4	Governance - Behaviour vs Outcomes	5

The full questionnaire can be seen as art of Appendix 1.

In designing the questions, the first questions from section 1 are of the category type in order to identify respondents as either male or female; management, consultant or data capturer; and industry; length of work and ERP experience; and to ascertain whether any of these factors account for any extreme difference in responses reordered for the rest of the questions in the questionnaire. The requirement to select the appropriate role that the respondent performed on the ERP project in question also helped the researcher in determining whether the respondent was relevant to the research or not.

The next set of demographic questions were included in order to gather information about the respondents last ERP project that they were involved with, as it is this project that the respondent has been asked to bear in mind when answering the rest of the survey questions.

4.6.1 Project success construct

The project success related questions are based on Khan et al., (2013) and cover, as per (Joslin & Müller, 2016) the five paradigms of project success which are "efficiency, organizational benefits, project impact, stakeholder satisfaction, and future potential" (p. 617). The project success criteria based on the work by Khan et al. (2013) is utilised as they have created a consolidation of a number of project success models based on the literature created by the leading researchers in the field over the last forty years. Minor changes were made to some of the project success questions in order to make them specific to ERP projects.

A five-point Likert scale was utilised for this section of questions to determine the degree to which the project was successful or not, and the scale is shown below in table 2.

Table 2
Five-point Likert scale anchors

Scale	Anchors
1	Not Successful
2	Slightly Successful
3	Moderately Successful
4	Highly Successful
5	Very Highly Successful

A successful project is determined via the criteria of project efficiency, organisational benefits, project impact, stakeholder satisfaction, and future potential. The questions were built to determine how successful the outcomes of the respondent's project were in terms of being completely unsuccessful, very successful, or somewhere in between. The questions also ensure that the short-term and long-term consequences of project success are covered.

Appendix 3 shows the specific question from the questionnaire that measure the level at which the respondent regards their last ERP project as being successful or not. The questions are shown in their random order as was in the actual questionnaire (see Appendix 1). The questions that relate to the specific subheadings of project success criteria, that is project efficiency, organisational benefits, project impact, stakeholder satisfaction, and future potential, can be seen split up under their relevant subheading in Appendix 2. The question number naming convention used throughout the questionnaire is in the format of "Section-Type_Section-Subheading_Question-Number. For example, the question number "**PS_PE_13**" as per the table below, indicates that the question is part of the project success questions, within the project efficiency construct, and is survey question number 13.

Using the answers from the survey, this construct of project success was then tested for validity, using the Pearson's correlation coefficient, and for reliability using the Cronbach's alpha. The values obtained by the usable questions within the survey are used to measure the level of ERP project success achieved.

4.6.2 Project governance construct

The questionnaire items for project governance are drawn from the work of Müller and Lecoeuvre (2014). These questions ensure that the two project governance dimensions that determine if the governance philosophy is shareholder or stakeholder oriented, and the level of governance control of strict process control or a project outcomes-based approach, are covered, and the questions have been utilised successfully in a number of research journals and surveys relating to project management and project governance (Müller & Lecoeuvre, 2014).

This section of questions utilises a 7-point semantic differential scale, as displayed in the table below. Respondents to the questionnaire were presented with two statements, A and B, and were required to determine which of the two statements they favoured or were more relevant in terms of the ERP project they were part of and that the survey is focused on.

Table 3
7-point Likert scale

Scale	Anchors	Rescaled Score
1	Strongly Favour A	1,0
2	Moderately Favour A	1,6
3	Slightly Favour A	2,3
4	Indifferent Between A & B	3,0
5	Slightly Favour B	3,6
6	Moderately Favour B	4,3
7	Strongly Favour B	5,0

Although a 5-point Likert scale was used in the study by Joslin and Müller (2016) and Müller and Lecoeuvre (2014), a 7-point Likert scale was used for the purposes of the section of the questionnaire as it increases the range of possible answers by the respondents, giving more specificity and truthfulness to the data (Dawes, 2008).

In the scale utilised for this section, a value between 1 and 7 was assigned to each specific answer given by the respondent. However, in order to make it more practical to statistically determine if there is a relationship between this study's two constructs, the values generated in the survey for the 7-point Likert scale were mathematically re-scaled to a 5-point Likert scale

and score, as shown in Table 4 above. This allowed the researcher to better statistically compare the project governance construct to the project success construct that was measured on the 5-point Likert scale. Dawes (2008) confirms that the rescaling technique between 5-point and 7-point Likert scales produces no statistically significant difference between "the scale formats in terms of variation about the mean, skewness or kurtosis" (p.61).

This next section of questions from the survey is split up into the two dimensions of governance and covers the specific method of project governance regarding a shareholder versus a stakeholder-oriented approach to governance and the method of project governance describing a process or behaviour controlled versus an outcomes-based approach to project governance. All survey questions in this section utilised the 7-point semantic differential scale, which were then rescaled to mimic the 5-point Likert scale.

4.6.2.1 Shareholder versus stakeholder orientation governance construct

The questions regarding a shareholder versus a stakeholder-oriented approach to project governance were developed and based on the study by Müller and Lecoeuvre (2014) and takes into account the other inputs and findings on this construct as is described in the literature review in this paper. Minor changes were made to some of the project governance questions in order to make them specific to ERP projects. The questions were designed to understand the degree to which individual respondents believed that the governance methods employed by themselves, their company, or the project team on the ERP project in question, are perceived as being focused on the objectives of all relevant stakeholders, or more swayed toward looking out for the interests of only the shareholders and owners of the organisation.

Table 4 below shows the questions used for this section of the survey where respondents were asked to what degree do they agree with statement A or statement B in terms of the decisions made within their organisation and on ERP projects.

Table 4
Shareholder versus stakeholder governance questions

Question Number	**Question**	
	Statement A	Statement B
PG_SH_45	Decisions are made in the best interest of the shareholders and owners of the organization and their return on investment (ROI)	Decisions are made in the best interest of the wider stakeholder community (including shareholder, employees, suppliers, local communities etc.).

PG_SH_46	The remuneration system includes stock-options for employees and similar incentives that foster shareholder ROI thinking	The remuneration system provides incentives for community, environmental, humanitarian or other non-profit activities outside and/or inside the organization
PG_SH_47	There prevails an image that profitability determines the legitimacy of actions (including projects)	There prevails an image that wider social and ethical interests determine the legitimacy of actions (including projects)
PG_SH_48	I am sometimes asked to sacrifice stakeholder satisfaction for the achievement of financial objectives	I am sometimes asked to sacrifice the achievement of financial objectives for improvement of stakeholder satisfaction
PG_SH_49	The long-term objective is to maximise value for the owners of the organization	The long-term objective is to maximise value for society

For this section, answers that favour statement A are indicative of a governance orientation that favours the side of the shareholder, while answers that favour statement B are indicative of governance method in which the interests of all stakeholders are taken into account.

Using the answers from the survey, this construct of a stakeholder versus a shareholder approach to project governance was then tested for validity, using the Pearson's correlation coefficient, and for reliability using the Cronbach's alpha. The values obtained by the usable questions within the survey will be used to measure the level at which the respondent believes that their project governance orientation id shareholder focused, or stakeholder focused.

4.6.2.2 Behaviour versus outcome control governance construct

The questions for the final section of the survey were also developed from the research of Müller and Lecoeuvre (2014) whom studied the connection between the theories of governance and organisation in order to categorise the methods by which a project can be governed into the two separate paradigms as being researched in this study. The project governance paradigm in question for this section is that of behavioural control versus outcomes-based control.

The questions as shown in table 6 below, sought to understand from the questionnaire respondents, to what degree they have perceived that the control structures employed by their organisations and on projects are either more heavily behaviour and process controlled versus control structures that are more outcomes based:

Table 5
Behaviour versus outcome governance questions

Question Number	Question	
	Statement A	Statement B
PG_BC_50	There is a strong emphasis on always getting personnel to follow the formally laid down procedures	There is a strong emphasis on getting things done even if it means disregarding formal procedures
PG_BC_51	There are tight formal controls of most operations by means of sophisticated control and information systems	There is loose, informal control; heavy dependence on informal relationships and the norm of cooperation for getting things done
PG_BC_52	A strong emphasis is placed on getting personnel to adhere closely to formal job descriptions	There is a strong emphasis to let the requirements of the situation and the individual's personality define proper on-job behaviour
PG_BC_53	Support institutions (like a Project Management Office or Team) should ensure compliance with the organization's project management methodology	Support institutions (like a Project Management Office or Team) should collect performance data in order to identify skills and knowledge gaps
PG_BC_54	There is a prioritisation of methodology compliance over people's own experiences in doing their work	There is a prioritisation of people's own experiences in doing their work over methodology compliance

For this section, answers from the respondents that favour statement A are indicative of a behaviour and process controlling method of project governance, while answers that favour statement B are indicative of the project governance method that prioritises the outcomes of activities, rather than how the activities are performed.

Using the answers from the survey, this construct of a behaviour versus an outcomes-based approach to project governance was then tested for validity, using the Pearson’s correlation coefficient, and for reliability using the Cronbach’s alpha. The values obtained by the usable questions within the survey will indicate the level at which respondents believe that the control method of governing projects is behaviour controlled or outcomes based.

4.6.3 Questionnaire piloting

The questionnaire contains a total of 54 questions which contain a mixture of questions on the demographics of the respondents and the variable of project success and project governance that relate to the research hypothesis that project governance methods adopted on ERP projects is associated with that project's success. The survey was piloted by sending it out to 4 respondents. 2 of the respondents were university colleagues with ERP project experience, whilst the other 2 had no experience in the field. The results of the pilot survey form no part of the official research and results.

The aim of the pilot questionnaire to correct any problems associated with it, fix spelling errors, change the way that the questions are asked, and to ensure easy usability of the survey. The test individuals for the survey were interviewed in which their individual accounts of their experience of the survey was obtained. Responses were obtained by the researcher to see if any problems were encountered or any difficulty in understanding the questions was experienced. Fortunately, there were no major issues found that the researcher was aware of that may have contributed to any errors in the collection of the data that needs to be disclosed in the findings section of this research (Zikmund, Babin, Carr, & Griffin, 2013). Only minor changes were made to the survey, which included a few spelling errors and word changes. These changes did not amend the core messages of the survey in any way. The test user feedback indicated that the questions were easily understood by individuals who have ERP project experience, were interesting, and were relevant in answering the research hypotheses.

However, the purpose behind first distributing the survey as a pilot was not to test for the appropriateness or validity of the questions or the constructs, or to gauge what the variables of interest may be, as the questions and questionnaire had been used before and are part of academic literature.

4.7 Data gathering process

As outlined in the above two sections, which also describes exactly how each respondent was identified and contacted using the purposive sampling approach, an online cross-sectional questionnaire was distributed to a range of people who possess the attribute of working with an ERP system at a large South African Corporate or Organisation (Lindell & Whitney, 2001).

The survey was distributed electronically via email and therefore the questions could be answered anonymously from the safety of their work environments or homes, without any other persons influencing or asking questions to them. This provides three benefits over one

on one interviews. Firstly, the respondents would not feel inclined to present their answers in a better light, which would represent untruthful results for the research. In a one on one interview, respondents may be prone to certain aspects of social desirability bias and present themselves in a better light which may skew the retrieved data in these kinds of interviews (King & Bruner, 2000).

Secondly, the time needed to administer all the structured interviews in the form of a survey sent via email was reduced. The survey was therefore completed by anyone with access to it without the researcher having to meet with all the individual participants. Thirdly, a great benefit to the researcher of an electronic questionnaire is that the respondent's data is automatically collected by the online platform used (i.e. Typeform) which eliminates the need to input the data manually and increase the risk of any data migration errors.

Thus, the data for the research was collected by sending the survey to purposely selected group of individuals who fit the research criteria of having ERP project experience in South Africa. Around 800 emails were sent out to individual email addresses and 170 respondents did input their answers to the questions online and their feedback was recorded on the platform used to generate and distribute the survey. An e-mail accompanied the link to the survey and was used as a type of covering letter to briefly explain the purpose of the questionnaire, and to ensure the respondent that it is not spam or a link to a virus. This also was a tactic to potentially improve the response rate to the survey. The survey tool used generated the feedback data automatically and populated a spreadsheet.

4.8 Analysis approach

As discussed, this study is quantitative in nature and was combined with and produced descriptive data (categorical and numerical) that can be used to identify and explain certain variables in relation to each other and to the constructs that were investigated, being project success and project governance. The data that was collected from the online survey and automatically collated by the Typeform platform, was downloaded by the researcher into Microsoft Excel. The downloaded data was in a raw and unformatted form which made it possible for the researcher to follow a structured approach to evaluating and scrutinising the data (Wegner, 2016).

The downloaded data was first evaluated for validity in terms of incomplete responses. All test runs of the survey were highlighted, and 21 respondents were identified as missing one or two answers from their submitted survey. Missing item responses were not estimated statistically but were rather excluded from the study of that particular variable (Craig & McCann, 1978).

The data was also analysed per respondent to see if the same response was given to every question, and fortunately, no surveys had to be deleted due to this reason.

Some changes to the respondent's answers were necessary. The free text field in which the respondent typed in the city in which the ERP project was performed was manually changed per user to ensure consistent spelling for reporting purposes. The question regarding project governance which were based on a 7-point Likert scale had to be converted from text to a numerical value based on the rescaled score shown in Table 4 in section 4.6.2 of this chapter.

Once the data was scrubbed and coded correctly, basic statistical analysis and more complex statistical modelling was conducted within Microsoft Excel using the statistical tools available within the software. The statistical techniques utilised, and steps taken to analyse the data were used in similar studies done to analyse relationships around either organisational or project success, ERP projects, and organisational or project governance, as conducted by Joslin and Müller (2016), Müller and Lecoeuvre (2014), and Wang and Chen (2006).

The first step in the statistical analysis was the compilation of a number of different demographics of the respondents to the survey. The next required parts are summarised into 6 main themes below.

4.8.1 Construct validity

A very important part of the statistical analysis was to test the questions and the three constructs (project success, stakeholder governance, and behaviour governance) for validity. For the proposes of this study, it was necessary to determine if significant relationships amongst the measured variables exist which is determined via the execution of a variety of exploratory factor analysis techniques.

In order to determine if factor analysis is the correct data reduction tool to use for this research, the KMO index and the Bartlett's test of sphericity were used. The KMO measures the adequacy of the sample whilst the Bartlett's test od sphericity is a comparison between the data's correlation matrix and the identity matrix to ascertain if any variables are not needed. A KMO value in excess of 0.5 and a significance level where p is greater than 0.05 are indicative that a factor analysis is appropriate (Field, 2014).

The exploratory factor analysis done in this research also helped to confirm if that data received from the respondents for project success construct can be used to gage the associated construct as a whole. Factor analysis was not suitable for testing the validity of the

project governance constructs due to the scale used to measure the answers of the respondents. The scale used required the respondent to choose between which of two statements they related two more in terms of how their organisation and projects are governed. Therefore, within one question there were 2 possible constructs, either the shareholder and stakeholder approaches to governance, or the behaviour control or outcomes control approaches to governance. A single question that has 2 or more possible factors within it cannot be run through any exploratory factor analysis tests. Validity for the project governance questions and construct was tested via the Pearson's correlation coefficient, as well as assumed through the previous and successful use and validity testing of the questions in the published works of Müller and Lecoeuvre (2014), Joslin and Müller (2015), and Joslin and Müller (2016).

In conducting the exploratory factor analysis tests on the project success construct, it is automatically assumed that any of the observed variables or responses could potentially be associated with any factor. Therefore, this analysis also provides a verification that each question does in fact relate to the desired construct as assumed previously in the research (Field, 2014). Through this verification, the researcher is able to reduce the respondent variable to a smaller set of summary variables and values which will deliver a stronger model of the underlying construct, and thus confirm the validity of the construct.

4.8.2 Measuring the reliability of the instrument

The reliability of the responses to the project success questions in the survey will be determined by running a series of Cronbach's Alpha tests. The Cronbach's Alpha is used to measure internal consistency. Hair, Black, Babin, and Anderson (2014) explain that reliability of all the constructs can be assumed if the Cronbach's alpha calculation has a value greater than 0.7. In measuring the internal consistency using Cronbach's alpha, the scale to be used has varied from study to study. Therefore, for this research, and based on other recent and related studies, the instruction of Tavakoi and Dennick (2011) will be adopted whereby an alpha value of between 0.7 and 0.9 will indicate internal consistency and thus, reliability.

Reliability of the project governance construct could not be determined successfully due to the reasons pointed out in section 4.8.1, however reliability was assumed as the project governance questions and construct were proven reliable through the previous and successful use and reliability / internal consistency testing of the questions in the published works of Müller and Lecoeuvre (2014), Joslin and Müller (2015), and Joslin and Müller (2016).

4.8.3 Descriptive statistics

Once the reliability of the survey and the validity of the constructs was established, a descriptive statistical analysis was conducted for each variable within the respondent's data in order to get an understanding for how respondents were generally answering the questions.

The mean scores were calculated for each question to discover the central tendency of answers (Wegner, 2016). The minimum and maximum scores given per question were calculated to indicate the highest and lowest that were given per question. And the standard deviation calculation would show how dispersed the answers were in general from the mean. Finally, scores were calculated for each construct by averaging out all the scores of the items within each construct, so that the mean, minimum, maximum, and standard deviation could be assessed for each of the 3 research constructs.

4.8.4 Analysis of variance across demographics

For certain cases, the mean scores per variable and per construct was compared across different demographics groups to ascertain if significantly different answers were received from respondents depending on their demographics. Two-sample pooled variance t-tests were performed on the answers given by male and female respondents as these are two independent and categorical variables (Wegner, 2016). For the t-test, a *p*-value of less than 0.05 at a 95% confidence interval will indicate that women and men responded significantly differently to each other.

To do the same type of testing for the variables in the study but where there were more than two categorical variables that the respondents were able to select, analysis of variance (ANOVA) tests had to be and were conducted (Wegner, 2016). Therefore, a one factor ANOVA analysis was conducted in order to find out if certain factors, for example, industry, work experience, age, and value of project, have an influence on the responses given in the survey. For this test, a *p*-value of less than 0,05 at a 95% confidence interval will indicate that a certain factor definitely has a significant influence on how the respondents answered that particular questions that were part of a specific construct.

4.8.5 Correlation analysis

Given the relevant scores received from the respondents to the survey, correlation analysis was conducted in order to ascertain the level of the relationship that may exist between certain variables and constructs (Wegner, 2016). To measure this potential correlation, specific

Pearson's correlation coefficient tests were performed. This is the most relevant measure for this research as the values found for the constructs (as outlined in section 4.8.3 and done via a descriptive statics analysis) were investigated using an interval measurement scale, and that in analysing correlations or associations in data that was obtained using Likert scales, the Pearson's test of correlation is the most idyllic (Boone & Boone, 2012).

The value extracted from a Pearson's correlation coefficient test can only be between the values of negative 1 and positive 1. A value close to negative 1 will show that a strong negative relationship exists between two variables, a value close to positive 1 will show that a strong positive relationship exists between two variables, and a value closer to 0 will show a weak relationship exists between the variables (Wegner, 2016). The Pearson's bivariate correlations were utilised to potentially show that all the survey questions that make up a specific construct have a significant correlation, and that certain constructs are associated with each other, which is evidenced by a confidence level of over 95% (i.e. a *p*-value of less than 0.05).

4.8.6 Hypotheses testing

Finally, the two key hypotheses of this study, as framed in chapter 2 and 3, set out to determine if a positively correlated relationship exists between a stakeholder-oriented approach to project governance and ERP project success, and if a positively correlated relationship exists between a behaviour controlling approach to project governance and ERP project success. To prove or disprove these hypotheses, the researcher performed statistical modelling in the form of linear regression to test the correlation amongst the relevant variables. Linear regression modelling is able to measure and provide a value in quantifying the relationship between the constructs, as well as measuring the strength of how well the linear regression model is able to predict the relevant relationship. This allowed the researcher to comprehend the predictive value, at specific significance levels, that a stakeholder-oriented approach to project governance has on ERP project success, and the predictive value that a behaviour controlling approach to project governance has on ERP project success (Wegner, 2016).

If it was found by the researcher during the statistical analysis phase of this study that either of the 2 research hypotheses was proven correct and significant, then the method of project governance described by the hypothesis (ether stakeholder orientation or behaviour control), then an exploratory analysis would be conducted to assess the relationship between these governance variables and each of the 5 sub dimensions making of project success (i.e. efficient project execution, organisational advances, project impact, future potential, and satisfying stakeholder needs). Through linear regression analysis, these project success sub-

dimension variable would be assigned as the dependent variables, with the method of project governance as the independent variable.

4.9 Research ethics

As per the 2018 regulations for an MBA research report submitted through the researcher's university, obtaining ethical clearance from the university id required as a prerequisite before any research data was gathered. This was to ensure that this study and its methods of data collection complied with the dictate from the Senate Committee for Research Ethics and Integrity of the University of Pretoria. This is to ensure:

i. Research participants and researchers are protected from harm or exploitation.
ii. The preservation of participant's rights is ensured, which take precedence over society's rights.
iii. There is reassurance to society that their rights are maintained.
iv. To protect your rights and interests as a researcher.

Ethical clearance was received for this study by the committee, and the researcher took all the necessary steps throughout the research proceeds to ensure that no regulations were breached, that the rights of any contacted respondents to the survey were maintained, and that they were treated with the utmost respect.

4.10 Limitations

As in many academic research studies, there are inherent and external factors that cannot completely be avoided or mitigated for. With regards to this specific quantitative research study, there are a number of reasons and factors that may cause or influence the results of the research to be slanted to some extent. A number of these issues are described below:

A very specific sampling frame as a consequence of the target population was impractical to construct in this research. Therefore, a purposive non-probability sampling method had to be used. Non-probability sampling runs the slight risk that the survey respondents making up the research sample may not completely and accurately represent the entire population of possible data values that exist for the variables to be studied (Newbold, Carlson, & Thorne, 2012). The size of the purposive sample is considered adequate for the research purposes and so mitigates this risk to some extent, but not completely.

Although a purposive non-probability and sampling method was used were potential respondents were contacted directly, and although the researcher did not request the sample

respondents to forward on the survey to any fellow colleagues or friends with ERP project experience, snowball sampling could not be completely avoided due to the electronic nature of the questionnaire. To avoid this risk to some extent, the question of what ERP project position the respondent held during the project was ask in the opening section of the survey, which also contained a blank free text field where they could indicate another position if not listed within the question. This served as a method for screening respondents if they did not fit the research criteria.

There is unquestionably the risk of certain bias being at play that is inherent in the individual respondent. These may include overconfidence bias, anchoring bias, confirmation bias, and availability bias (Robbins & Judge, 2015). It is felt that the largest risk with regards to biases and this research, is the notion that people are most susceptible to an implicit or unconscious bias, regardless of whether the survey is completed on line or face-to-face, and that respondents can tend to present themselves in the best light possible, and even exaggerate, even when survey anonymity is guaranteed (Alessi & Martin, 2010). There is the added risk that respondents may simply be dishonest or make human errors whilst answering the survey questions.

The target population was solely, yet purposely, derived from ERP project participants who work for South African organisations, or the client at which the ERP project was executed, is South African. This therefore excludes how the variables within the constructs of this research may be associated with each other for projects executed in other countries.

Due to the study prescribing to a cross-sectional methodology, the research results only provide a view of the respondent's perceptions to project governance and success at a specific moment in time, and therefore does not cater for people altering their perception to the situation over time (Saunders & Lewis, 2018).

The individual survey questions that are meant to make up a specific construct may have been misread or not understood by the respondent which runs the risk that an ill-informed guess may have been made in attempting to answer the question. Unfortunately, even the piloting of the survey may not have been enough to fully mitigate this risk.

5 Research results

5.1 Introduction

This chapter presents the findings and results of the data that was obtained through respondents that participated in the research survey. It also shows and enables a deeper understanding of the data through a number of statistical tests that were carried out in order to prove or disprove the research hypotheses being to determine if a positive correlation exists between a stakeholder-oriented approach to project governance and ERP project success, and if a positively correlation exists between a behaviour controlling approach to project governance and ERP project success.

This section will begin with feedback regarding the number of survey responses received, followed by a presentation of the different demographics of the respondents to the survey, along with certain descriptive statistics, such as means and standard deviations, that aid in further explaining the makeup of the data and constructs. The chapter then moves onto a display of the results of the test carried out to measure and examine the relationships between these constructs, with commentary regarding how the validity and the reliability of the constructs was ensured.

The 166 answered surveys were provided by ERP project participants that executed these projects at a South African company or organisation. This provided for a homogeneous sample of the target population. All results that follow in the chapter are built from the data provide by the sample of respondents.

5.2 Survey responses

The survey responses were collected over a period of 3 months between November 2018 and February 2019. A total of 170 ERP project participants participated in the survey, with 4 of those participants being the survey pilot respondents. This represents a response rate of just over 20% of the 800 individuals to which a request to complete the survey was sent to. These survey responses did include 21 examples were one or two questions were left blank by the respondents. Uncompleted questions were not taken into account within the data analysis presented in this chapter, and therefore had no effect on the analysis of constructs.

5.3 Respondent demographics

The target population of the research were those individuals with ERP project experience at a South African organisation. The 166 respondents gave feedback on a total of eleven demographic questions which can be divided into gender, ERP project experience, and work experience. The remaining 7 demographic questions specifically related to the project that was the subject of the survey, and were comprised of ERP project position held, the industry of the client, the city in which the project work was performed in, project duration, project complexity, project urgency, project cost, and organisational structure of the client.

There was a large difference noted in the sample of respondents with females only representing under a third of all respondents. Three options were given to the respondent to specify their gender, with the third option being prefer not to say. The were no responses that indicated anything other than male or female, meaning that almost 70% of the sample was male.

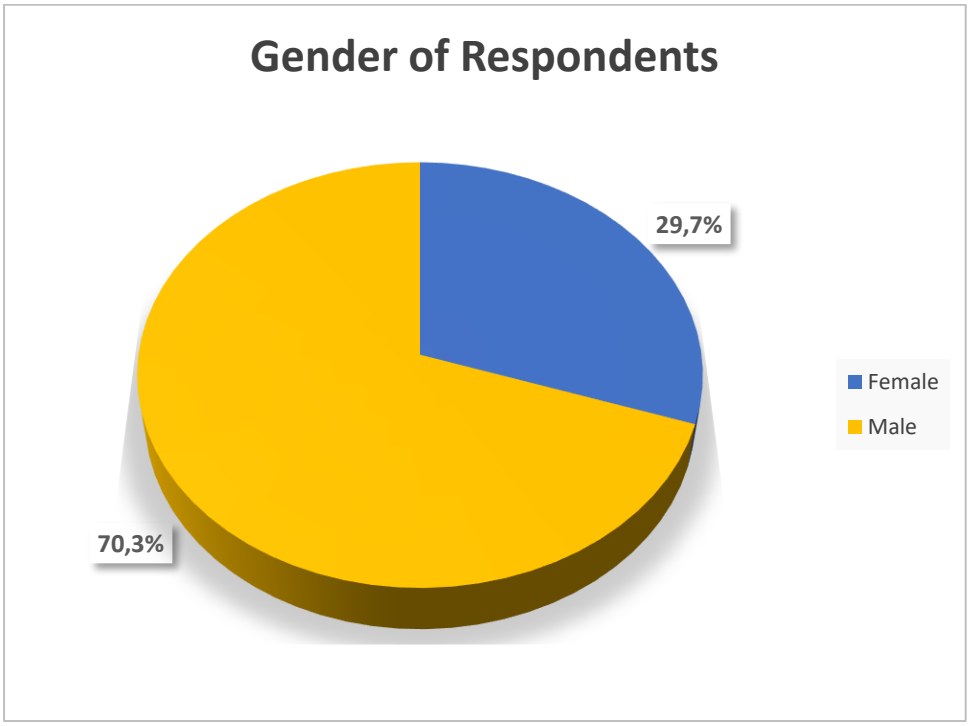

Figure 3. Gender diversity breakdown

To ascertain how experienced respondents were in terms of years employed, over 77% of respondents indicated that they had over 5 years of work experience. The largest demographic for this section was 5 to 10 years of work experience, with 67 of the respondents selecting this option.

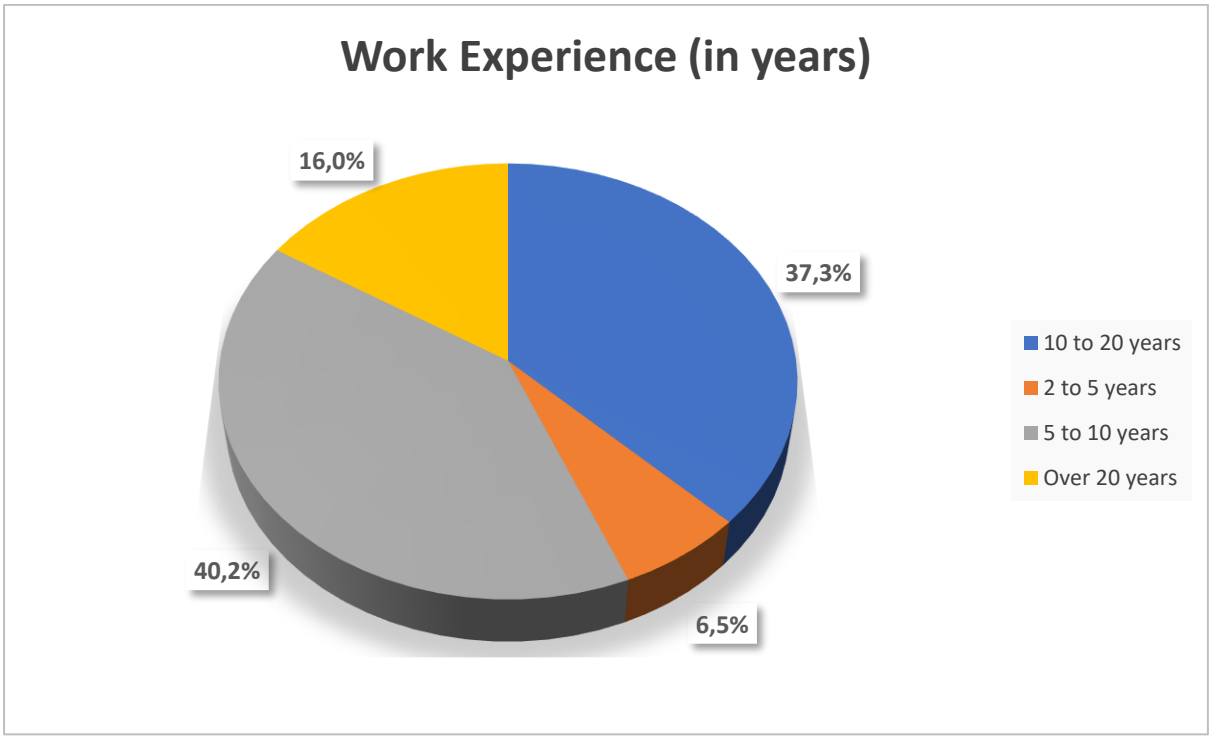

Figure 4. Respondent work experience

In order to gage the amount of experience the respondents had with ERP software projects, they were asked to choose from a range of options which showed their years of experience with ERP projects. Of the 166 respondents, 39% had ERP experience of between 5 and 10 years, with the next biggest portion of respondents being 26% of them having between 10 and 20 years of ERP project experience. Overall, around 70% (118 individuals) of the respondents indicated that they had over 5 years of experience with ERP projects.

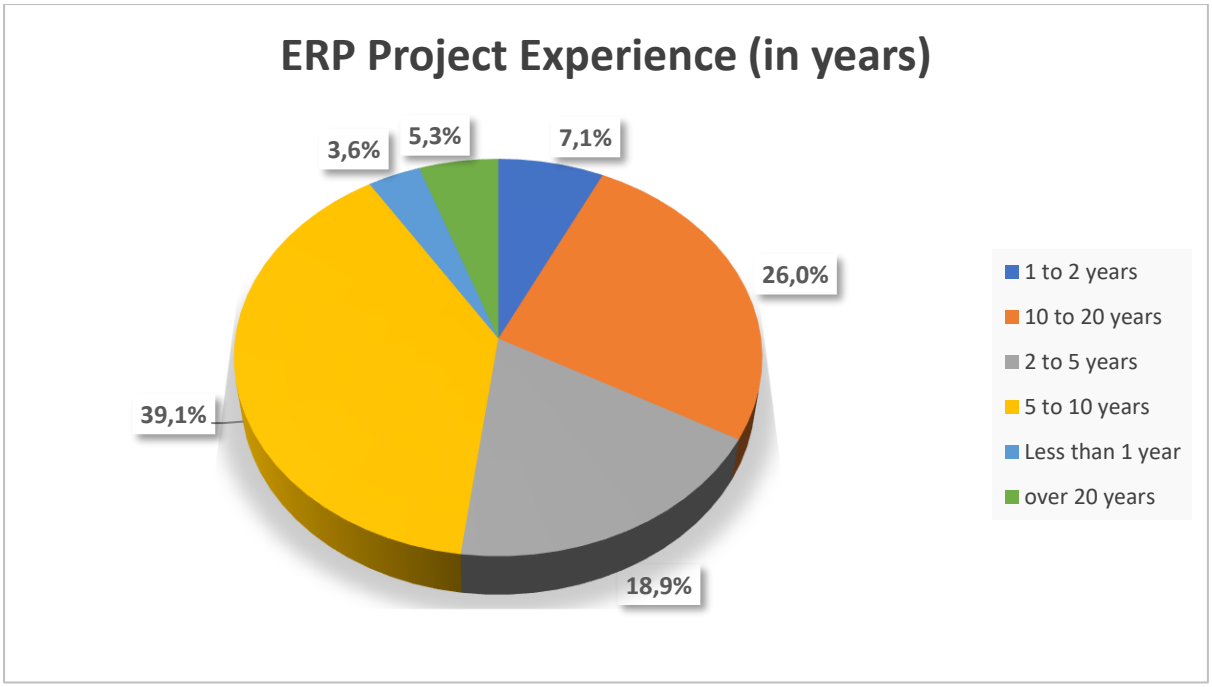

Figure 5. Respondent ERP project experience

With regards to the respondent's demographics specific to the ERP project of which the respondents were being questioned on, the results begin with the position that the respondent held whilst apart of the ERP project. The largest component of this demographic came from the 39% of respondents whom are ERP professionals and consultants, and therefore experts of the ERP software. The next largest response came from those 27% of the respondents who were the project managers on the ERP project. Therefore, ERP professionals and project managers together make up over 65% of the total respondents (107 individuals).

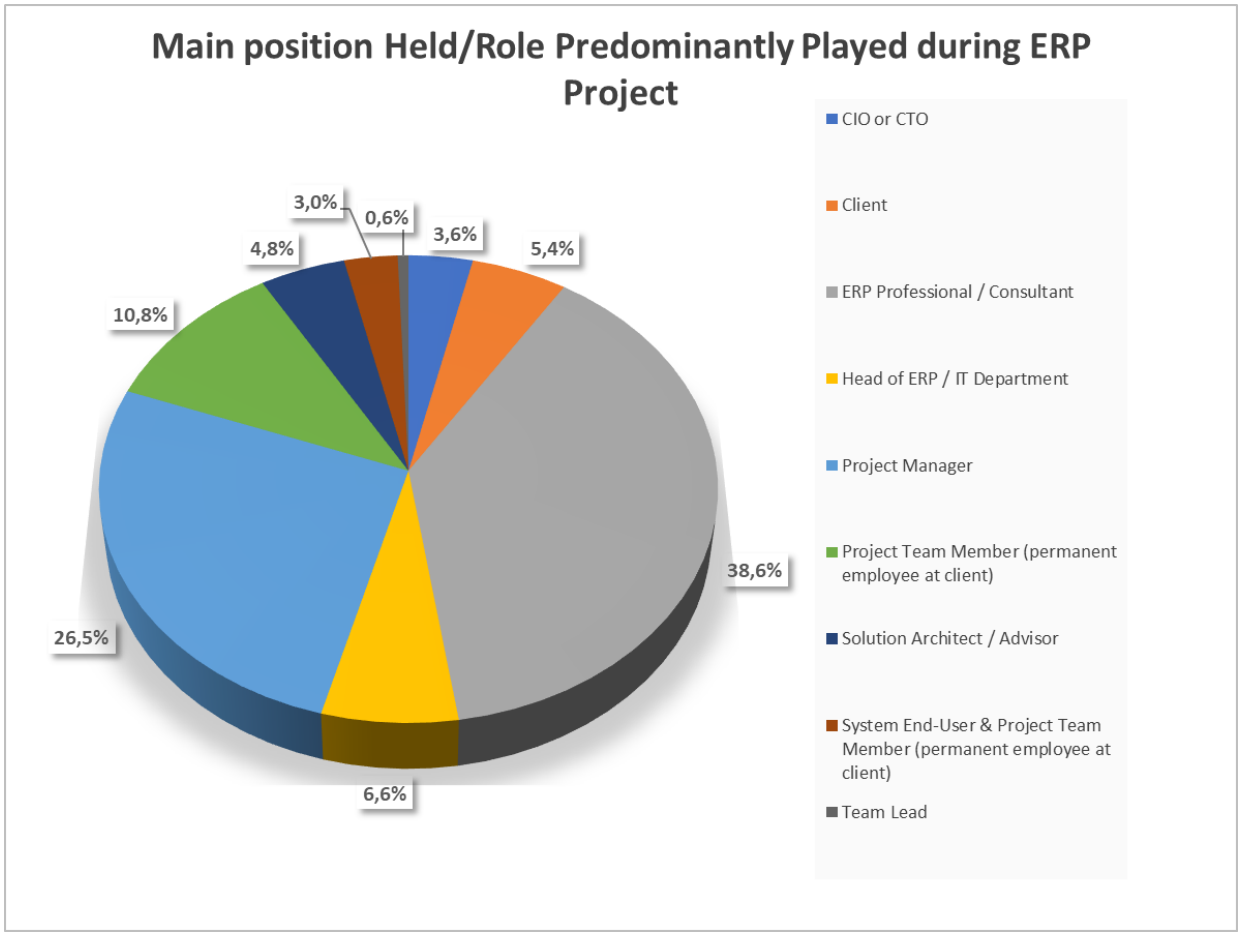

Figure 6. Respondent's project role

The industries of the clients at which the ERP projects were executed at is shown in table 7 below. There were 12 different industry options available for the respondent to select on the survey. The two industries with the most representation was that of the financial services (20%) and the wholesale or retail trade (20%) industries (34 individuals in each instance). There was the option for the respondent to select other as the industry may not had been listed, and only 2 percent of the respondents selected this option.

Table 6
Sector / industry of client

Answer Options	Response %	Count
Agriculture	1,78%	2
Construction or Engineering	8,88%	15
Financial Services	20,12%	34
Government or Municipal Services	6,51%	11
Information & Communications Technology	15,98%	27
Manufacturing	15,38%	25
Mining or Energy Production	4,73%	8
Other	2,37%	3
Security	0,59%	1
Services	0,59%	1
Tourism	2,96%	4
Wholesale or Retail Trade	20,12%	34
	100%	165

The next categorical question was used to segment the respondents in terms of in which city within South Africa the majority of the work was performed. It was no surprise that the overwhelming majority (72%) of the respondent indicted Johannesburg as their answer as it is the home base of the researcher, and is widely considered as the financial capital of South Africa. The other city selected and listed here in order of most to least selected were Cape Town, Pretoria, Port Elizabeth, and Durban.

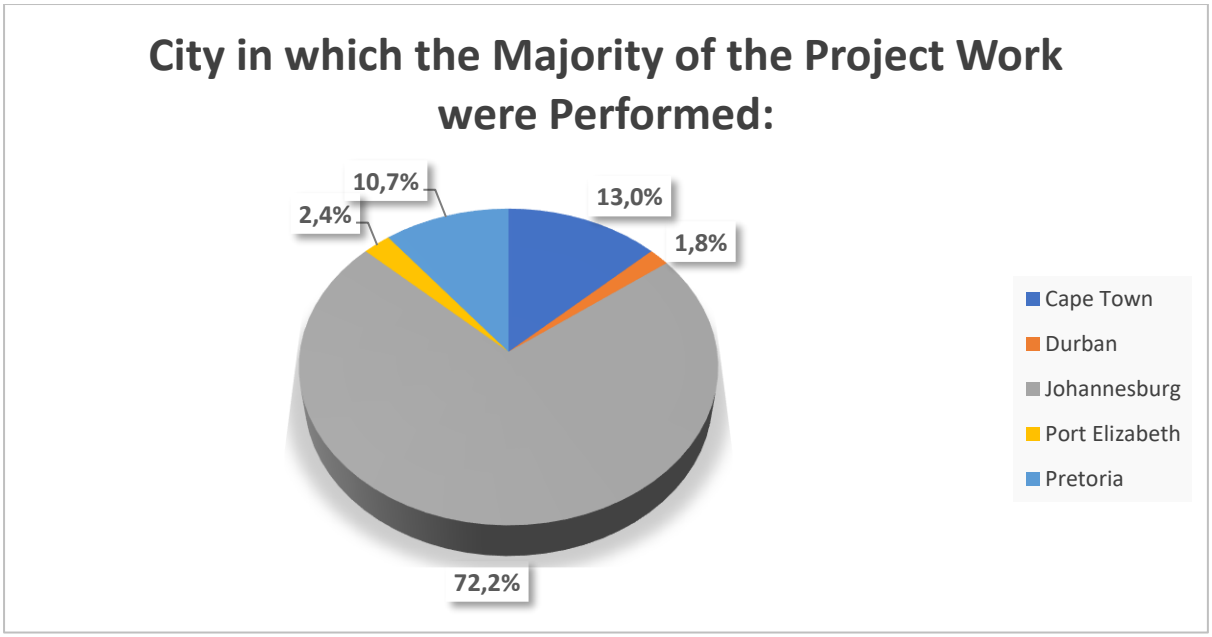

Figure 7. City where project executed

Respondents were asked to indicate what the time duration, from start to finish, was of the ERP project in question. 95 respondents indicated that the duration of their project was between 1 and 2 years.

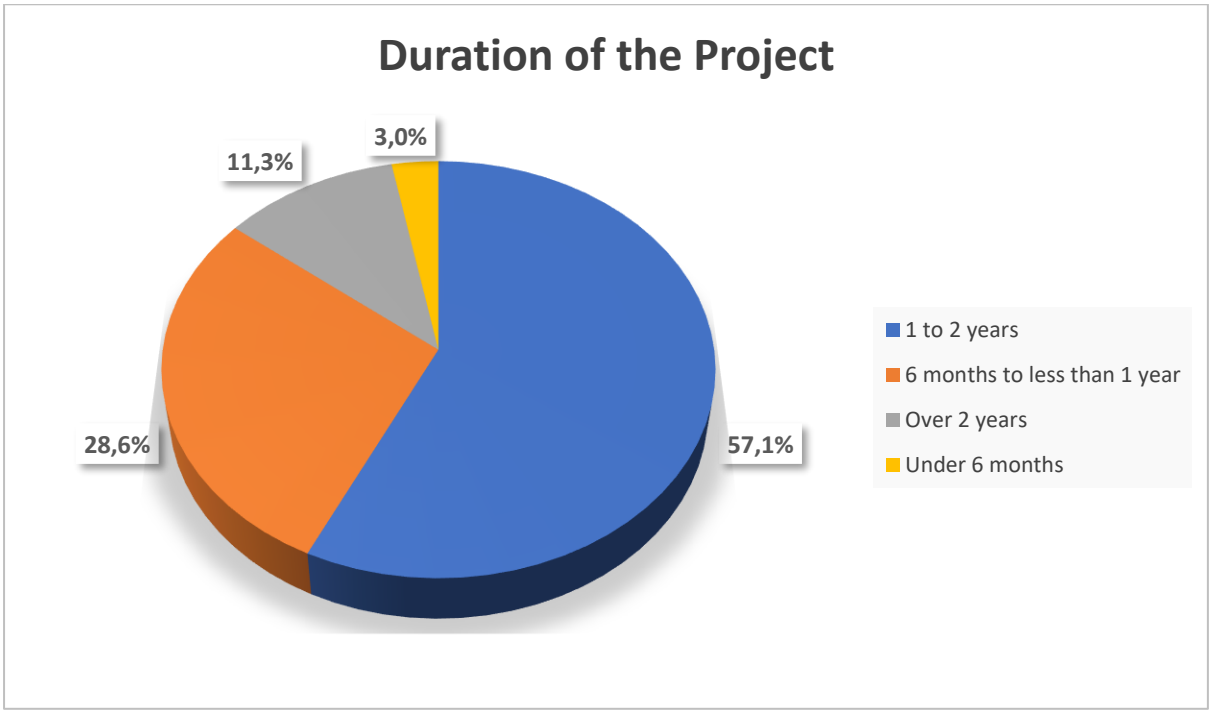

Figure 8. Project duration

The next 2 categorical questions were designed to ascertain from the respondents what the level of complexity and urgency was with regards to the ERP project in question. In both instances, only 1,2% of the respondents indicated that the project was of low complexity and urgency. Over half of the responses (51,2%) show that the project was of high complexity, with almost 70% indicating that the projects were only of medium urgency. It can then be said that for this sample, ERP projects are of medium to high complexity, but only of medium urgency in general.

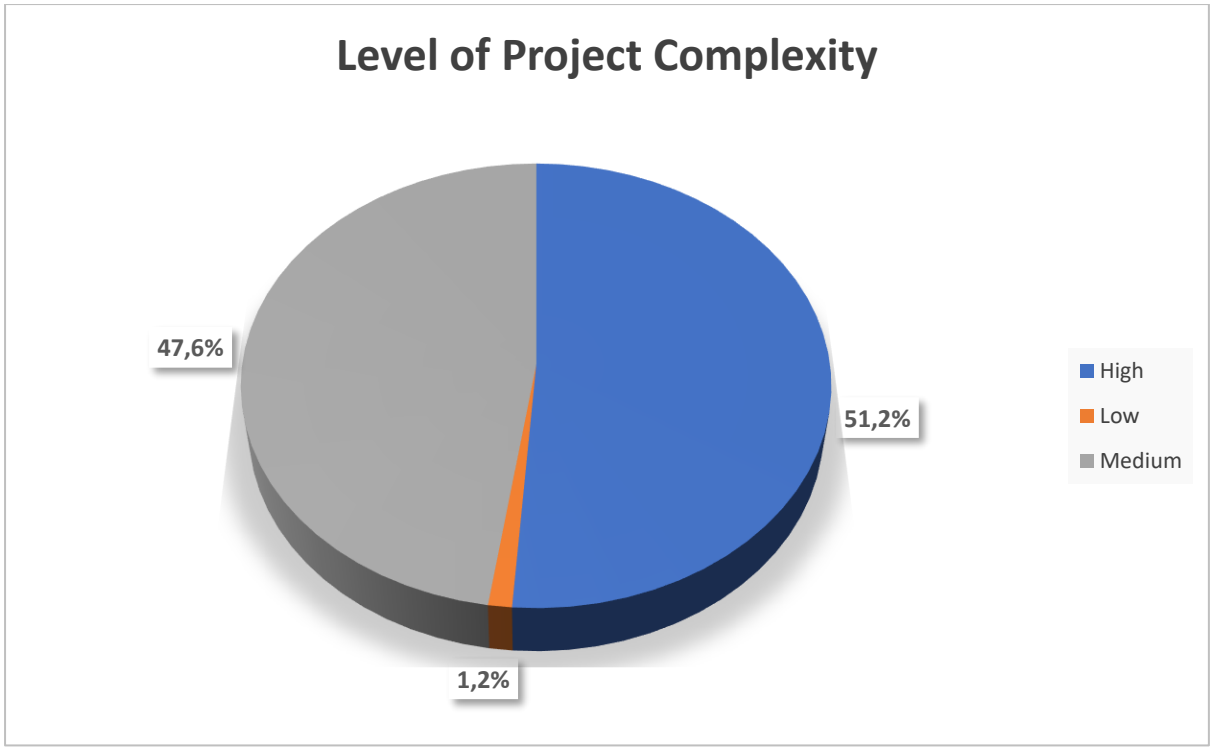

Figure 9. Level of project complexity

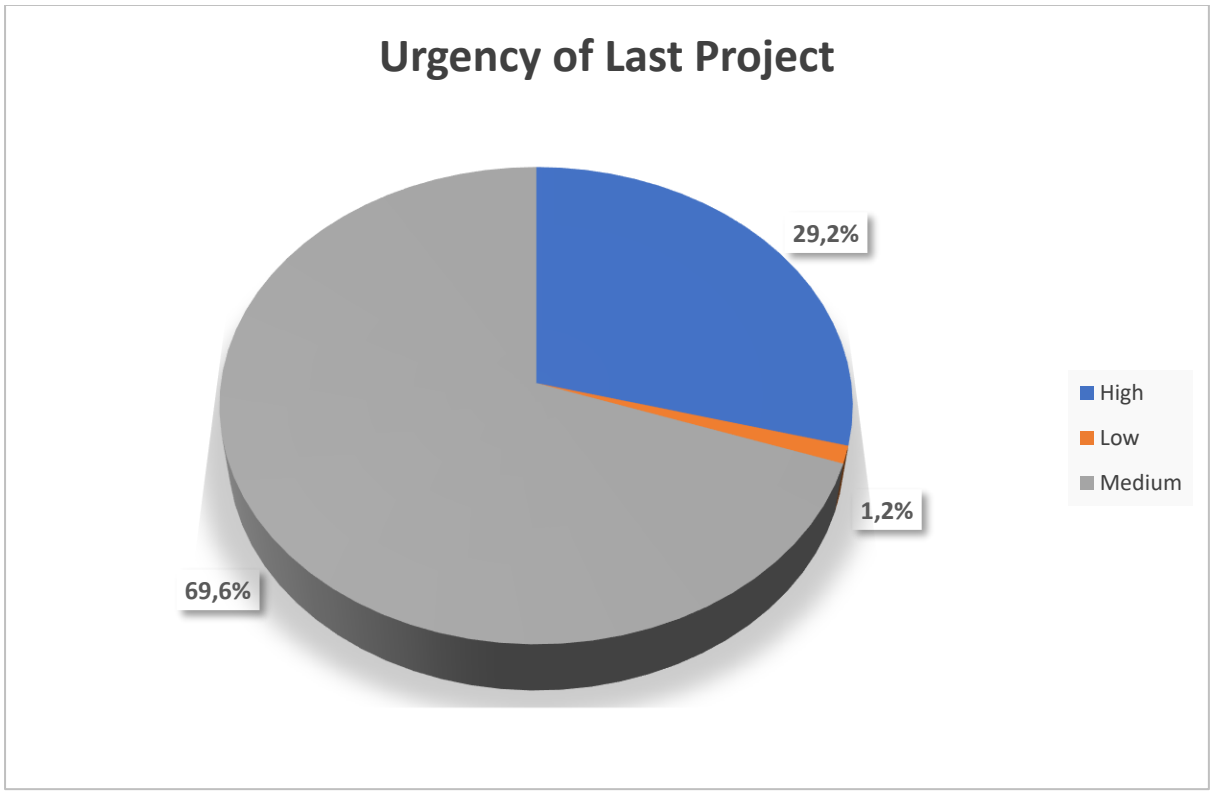

Figure 10. Urgency of ERP project

Respondents were also asked to indicate what the rough cost was of the ERP project in question. It can be said that the ERP projects in this sample are quite costly as, when specific responses are combined, 70% of the respondents indicated that the value of these ERP projects were R5 million.

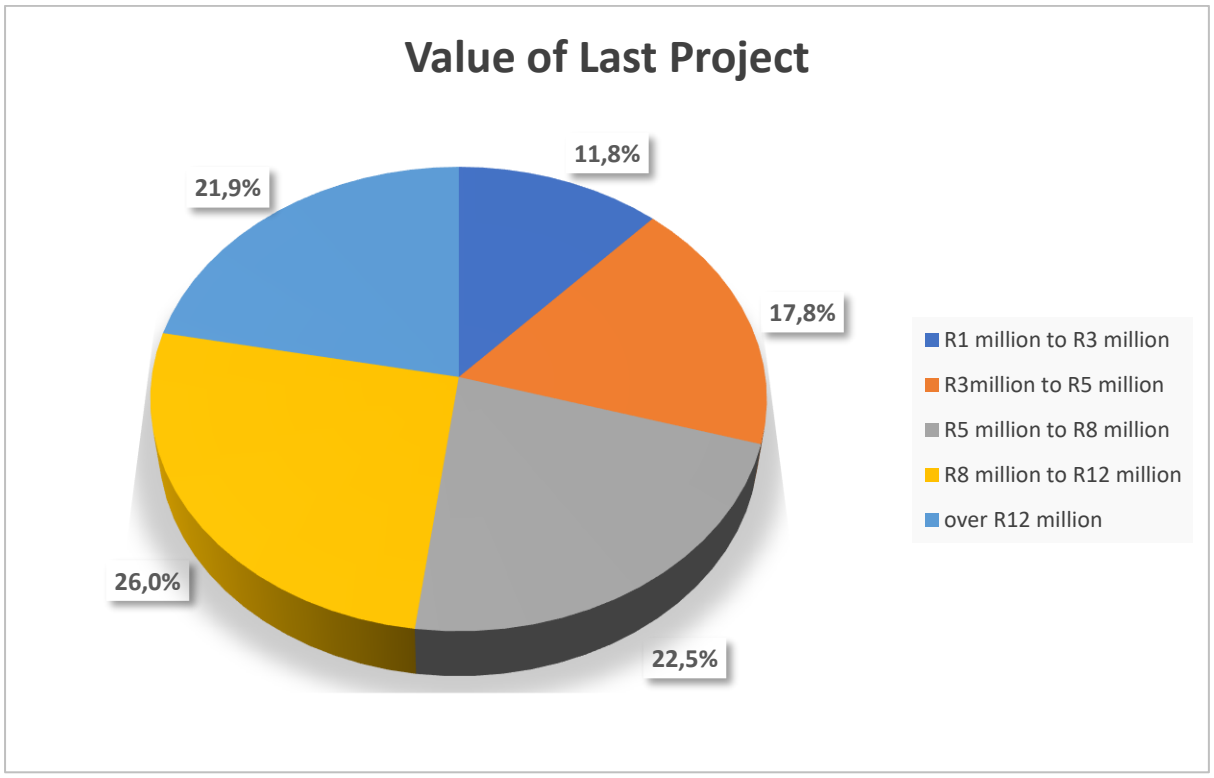

Figure 11. Cost of ERP project

The final categorical question was used to understand what type of organisational structure was adopted by the client at which the ERP project was executed. Over half of the respondents (55%) indicated that the adopted organisational structure was a mixture of a functional organisation (a hierarchical organization structure wherein people are grouped as per their area of specialization) and a projectized organisation (organizations arrange their activities into programs or portfolios and implement them through projects). Only 3.6% of the respondents (6 individuals) claimed that the organisation was solely of a projectized structure.

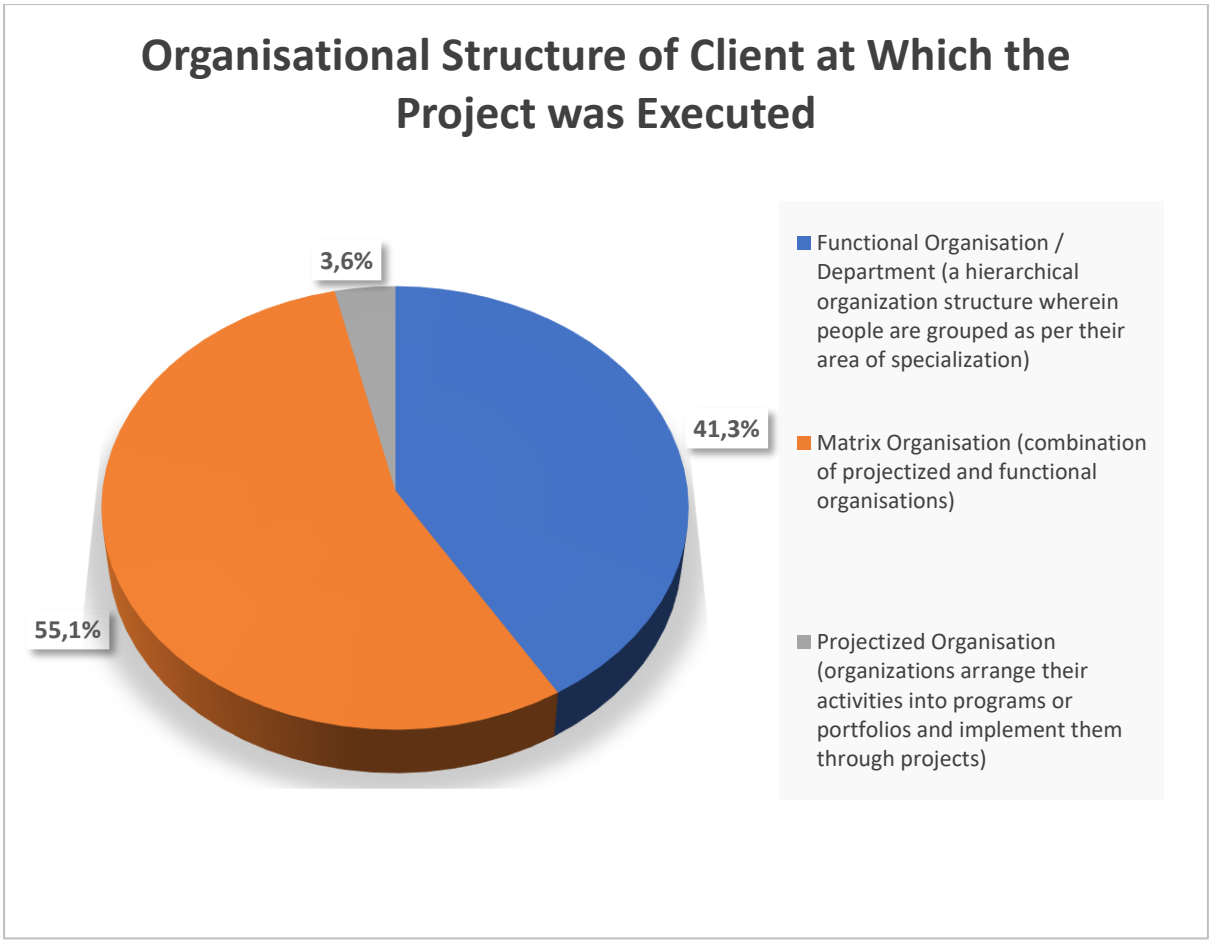

Figure 12. Client organisational structure

5.4 Construct validity

Before running any detailed statistical tests on the gathered survey data, it was important to validate the constructs focused on in this research paper. This was achieved through an exploratory factor analysis on the project success questions. The use of the Kaiser Meyer Olkin (KMO) and Bartlett's test for sphericity were to ascertain if a factor analysis test was suitable for the collected data.

For the reasons discussed in section 4.8.1, exploratory factor analysis tests could not be run on the project governance questions. Validity for the project governance questions and construct was assured through the pervious and successful use and validity testing of the questions in previously published academic journals.

5.4.1 KMO and Bartlett's test for sphericity results

The KMO result, as shown in table 7 below, for measuring sample adequacy for all the combined scores for the project questions shows a value of 0.915 which is well above the recommended value of 0.5 (Field, 2014). Furthermore, the below results show that the Bartlett's test for sphericity is statistically significant with a p-value of less than 0.001, which is below the level of significance of 0.05. These test values shown below therefore indicate that the results from a factor analysis may be suitable based on the available data and that a factor analysis is appropriate for the project success questions.

Table 7
KMO & Bartlett's test results

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.915
Bartlett's Test of Sphericity	Approx. Chi-Square	3384.835
	df	496
	Sig.	.000

5.4.2 Exploratory factor analysis results

An exploratory factor analysis was performed on the project success construct questions. It was exploratory as the researcher wanted to create his own set of new project success dimensions specific for ERP projects. The factor analysis was specifically done through principle axis factoring as the extraction method. Six factors were identified by the factor analysis, using the Kaiser Criterion of Eigenvalues larger than one (Kaiser, 1970). These 6 factors explained a total of 68.318% of the variance

The project success survey questions were loaded onto a factor if that loading was greater than 0.3 or less than negative -0.3. The closer the coefficient is to a value of one indicates that particular question is highly associated to that factor, whereas a coefficient value closer to zero indicates a much weaker association. The minimum coefficient that should be used to load a question to a factor is 0.3 as recommended by Gaskin and Happell (2014), and it is suggested that items with a lower coefficient be disregarded. Therefore, question PS_PE_19 was eliminated from this study and was not utilised in any further statistical testing. The detailed results of the exploratory factor analysis are shown in table 8 below.

Table 8
Project success factor analysis

6 factors: Eigenvalue and Horne

Pattern Matrix[a]

Sub-dimensions		Factor 1	2	3	4	5	6
Project Benefits & Stakeholder Satisfaction	PS_FP_26 The project outcome created an improvement in organisational capability.	0,615					
	PS_OB_17 The project yielded business and other benefits.	0,677					
	PS_OB_22 The project adhered to the defined procedures of the client	0,773					
	PS_OB_40 The end product, as a result of the project, was used as planned.	0,820					
	PS_OB_43 The project satisfies the needs of the users.	0,678					
	PS_PE_21 The project met the planned quality standards.	0,728					
	PS_PE_24 There was a smooth handover of the project outputs.	0,399					
	PS_PI_29 The project's impact on its beneficiaries are visible.	0,536					
	PS_PI_30 The project achieved its purpose.	0,731					
	PS_PI_35 The End-User group was satisfied.	0,647					
	PS_SS_14 The ERP service providing company (the firm contracted to execute the project in conjunction with the client) was satisfied with the project outcomes.	0,414					
	PS_SS_18 The project met the client's requirements.	0,564					

	PS_SS_34 The project's steering group was satisfied.	0,449				
	PS_SS_36 The project team was satisfied.	0,457				
	PS_SS_39 The project sponsor/s was satisfied.	0,486				0,389
	PS_SS_42 The project met the organisational objectives.	0,856				
Future Potential	PS_FP_15 The project was enabling of other related project work in future.		0,856			
	PS_FP_28 The project could be used as motivation for future projects.		0,640			
Project Reputation	PS_PI_16 The project was perceived as being highly successful by the client's competitors and other businesses (including other ERP project and support firms).			0,817		
	PS_PI_31 The project has good reputation amongst the other business units, competitors and ERP project providing firms.			0,748		
Project Learnings & Personal Rewards	PS_SS_44 There were personal non-financial rewards as a result of the project.				0,583	
	PS_SS_41 There were personal financial rewards as a result of the project.				0,442	
	PS_OB_23 The project provided valuable learnings to most stakeholders.				0,419	
	PS_OB_33 New understanding and knowledge was gained from the project.				0,384	
Project Efficiency	PS_PE_37 The project activities were carried out as scheduled.					0,663
	PS_PE_25 The project resources were mobilised and used as planned.					0,476

	PS_PE_13 The project was completed according to the specifications.	0,390				0,410	
Project Costs, Deadlines & Scope	PS_PE_38 The project finished within budget.						-0,837
	PS_PE_20 The costs and budget for the project were judged as being used effectively.						-0,625
	PS_PE_32 The project finished on time.						-0,617
	PS_PE_27 The project required a minimum number of agreed scope changes.						-0,402
	PS_PE_19 The project caused minimum disruption to the organization						

The above factor analysis did not perfectly correspond with the official five project success dimension as provided by the work of Khan et al. (2013) (see Appendix 2), and successfully used as individual constructs in the research of Joslin and Müller (2016). As a result, the researcher looked for the common themes present in the questions that have been grouped together as per the factor analysis shown above. The six new project success dimensions to be utilised in this study going forward are:

- Project Benefits & Stakeholder Satisfaction
- Future Potential
- Project Reputation
- Project Learnings & Personal Rewards
- Project Efficiency
- Project Costs, Deadlines & Scope

These new ERP project success dimensions are considered very similar in name and in the questions that they contain, to the original set of dimensions of Khan et al. (2013). Some dimensions have just simply been combined or separated, and thus renamed.

Through a principal component analysis extraction which is produced as part the KMO and Bartlett's tests, the results indicate that the 6 factors of project success shown above can explain a total of 68.318% of the variance.

5.5 Project success construct

As mentioned, the project success construct and relevant subdimensions was based on the work by Khan et al. (2013). This work was then successfully amended into questions that were used as part of a success research survey sent to respondents in the form of an online questionnaire (Joslin & Müller, 2016). These same questions were utilised in the online survey for this study. However, due the results of the exploratory factor analysis, as shown in section 5.4.2, the individual questions were arranged into new subdimensions by the researcher that were very similar to the original dimensions, but made more sense from and ERP project perspective.

5.5.1 Project success – Cronbach alpha results

In order to measure the reliability of the research instrument (online questionnaire), Cronbach's alpha tests were performed to test for internal consistency on the project success construct by running the test per sub-dimension of project success and the individual questions contained within these dimensions.

The first Cronbach's alphas test was performed on the project benefits & stakeholder satisfaction dimension of project success, followed by future potential, project reputation, project learnings & personal rewards, project efficiency, and finally, project costs, deadlines & scope.

Table 9
Project benefits & stakeholder satisfaction reliability statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0,954	0,954	16

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PS_FP_26 The project outcome created an improvement in organisational capability.	61,85	61,671	0,673	0,502	0,952
PS_OB_17 The project yielded business and other benefits.	61,82	60,198	0,744	0,618	0,950

PS_SS_14 The ERP service providing company (the firm contracted to execute the project in conjunction with the client) was satisfied with the project outcomes.	61,66	61,195	0,679	0,523	0,952
PS_SS_18 The project met the client's requirements.	61,92	59,854	0,794	0,656	0,949
PS_PE_21 The project met the planned quality standards.	61,96	60,432	0,739	0,609	0,950
PS_OB_22 The project adhered to the defined procedures of the client	61,92	60,809	0,701	0,585	0,951
PS_PE_24 There was a smooth handover of the project outputs.	62,23	61,378	0,639	0,513	0,953
PS_PI_29 The project's impact on its beneficiaries are visible.	61,97	62,655	0,654	0,540	0,952
PS_PI_30 The project achieved its purpose.	61,87	60,027	0,802	0,677	0,949
PS_SS_34 The project's steering group was satisfied.	62,13	62,129	0,728	0,699	0,951
PS_PI_35 The End-User group was satisfied.	62,12	60,845	0,758	0,705	0,950
PS_SS_36 The project team was satisfied.	61,79	59,517	0,749	0,614	0,950
PS_SS_39 The project sponsor/s was satisfied.	62,17	61,442	0,739	0,703	0,951
PS_OB_40 The end product, as a result of the project, was used as planned.	61,85	60,851	0,786	0,687	0,950
PS_SS_42 The project met the organisational objectives.	61,94	59,978	0,805	0,690	0,949
PS_OB_43 The project satisfies the needs of the users.	62,11	61,931	0,749	0,664	0,950

The reliability for the project benefits & stakeholder satisfaction dimension of project success has been measured as acceptable with a Cronbach's alpha value of 0.954 for the 15 items.

The values in the above table also indicate that by deleting any of the items, the Cronbach's alpha would not be enhanced. Also taking into account the results from the factor analysis for this project success dimension that showed that the items had high communality and association within the construct of project benefits & stakeholder satisfaction. It was therefore determined that all 15 questions within the construct would be used in the hypotheses testing shown later in this chapter.

Table 10
Future potential reliability statistics

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0,744	0,745	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PS_FP_15 The project was enabling of other related project work in future.	3,99	0,589	0,594	0,353	
PS_FP_28 The project could be used as motivation for future projects.	4,05	0,498	0,594	0,353	

The reliability for the future potential dimension of project success has been measured as acceptable with a Cronbach's alpha value of 0.744 for the two items. The values in the above table within the Cronbach's alpha if item deleted column are blank as there were only 2 items within the dimension and so a score could not be computed. However, taking into account the strong Cronbach's alpha value and the results from the factor analysis for this project success dimension that showed that the items had high communality and association within the construct of future potential. It was therefore decided that two questions within the construct were to be used in the hypotheses testing shown later in this chapter.

Table 11
Project reputation reliability statistics

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0,814	0,816	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PS_PI_16 The project was perceived as being highly successful by the client's competitors and other businesses (including other ERP project and support firms).	3,23	0,554	0,689	0,474	
PS_PI_31 The project has good reputation amongst the other business units, competitors and ERP project providing firms.	3,09	0,649	0,689	0,474	

The reliability for the project reputation dimension of project success has been measured as acceptable with a Cronbach's alpha value of 0.814 for the two items. The values in the above table within the Cronbach's alpha if item deleted column are blank as there were only 2 items within the dimension and so a score could not be computed. However, taking into account the strong Cronbach's alpha value and the results from the factor analysis for this project reputation dimension that showed that the items had high communality and association within the construct of project reputation. It was therefore decided that two questions within the construct were to be used in the hypotheses testing shown later in this chapter.

Table 12
Project learnings & personal rewards reliability statistics

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0,597	0,615	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PS_SS_44 There were personal non-financial rewards as a result of the project.	11,55	2,201	0,478	0,249	0,442
PS_SS_41 There were personal financial rewards as a result of the project.	12,32	2,688	0,334	0,171	0,571
PS_OB_23 The project provided valuable learnings to most stakeholders.	10,50	3,288	0,353	0,247	0,551
PS_OB_33 New understanding and knowledge was gained from the project.	10,61	3,215	0,403	0,289	0,523

The reliability for the project learnings & personal rewards dimension of project success has been measured as unacceptable with a Cronbach's alpha value of 0.597 for the two items. It is unacceptable due to the preestablished threshold that the Cronbach's alpha value would need to be a minimum of 0.7 in order to conclude internal consistent and reliability. In other studies, one can make the Cronbach's alpha for this dimension more reliable by removing one or more items from the computation, but for this construct, that is not the case. Therefore, as the dimension has not reached acceptable reliability, the construct, and the items within it, are not used in any further statistical analyses described in the rest of this chapter.

Table 13
Project efficiency reliability statistics

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0,744	0,743	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PS_PE_37 The project activities were carried out as scheduled.	7,92	1,181	0,639	0,411	0,573
PS_PE_25 The project resources were mobilised and used as planned.	7,80	1,304	0,579	0,356	0,647
PS_PE_13 The project was completed according to the specifications.	7,33	1,572	0,503	0,259	0,733

The reliability for the project efficiency dimension of project success has been measured as acceptable with a Cronbach's alpha value of 0.744 for the three items. The values in the above table also indicate that by deleting any of the items, the Cronbach's alpha would not be enhanced. Also taking into account the results from the factor analysis for this project success dimension that showed that the items had high communality and association within the construct of project efficiency. It was therefore determined that all three questions within the construct would be used in the hypotheses testing shown later in this chapter.

Table 14
Project costs, deadlines & scope reliability statistics

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0,867	0,869	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PS_PE_38 The project finished within budget.	10,49	4,967	0,839	0,731	0,777
PS_PE_20 The costs and budget for the project were judged as being used effectively.	10,11	6,296	0,709	0,529	0,840
PS_PE_32 The project finished on time.	10,36	5,008	0,761	0,646	0,815
PS_PE_27 The project required a minimum number of agreed scope changes.	10,55	6,322	0,598	0,362	0,875

The reliability for the project costs, deadlines & scope dimension of project success has been measured as acceptable with a Cronbach's alpha value of 0.867 for the four items. The values in the above table also indicate that by deleting any of the items, the Cronbach's alpha would not be enhanced, except for item PS_PE_27. The decision was taken by the researcher not to delete the item from the construct as it would only enhance the Cronbach's alpha value slightly, and that the topic of the question around scope changes is a very important and relevant issue when dealing with ERP projects. Also taking into account the results from the factor analysis for this project success dimension that showed that the items had high communality and association within the construct of project costs, deadlines & scope. It was therefore determined that all three questions within the construct would be used in the hypotheses testing shown later in this chapter.

Reliability can therefore be assumed for the project success construct as all items within each of the six project success dimensions have a Cronbach's alpha value of higher than 0.7 (Hair et al., 2014).

5.5.2 Project success – intercorrelations between factors

The Pearson's correlation analysis extracted in table 15 below for the project success construct is used to understand the relationships between each of the project success dimensions and their relationship with the overall project success construct.

Table 15
Project success Pearson's correlation

Correlations

		Project benefits and stakeholder satisfaction	Future potential	Project Reputation	Project costs, deadlines and scope	Project efficiency	Project sucess total
Project benefits and stakeholder satisfaction	Pearson Correlation	1	.270**	.379**	.645**	.718**	.953**
	Sig. (2-tailed)		0,000	0,000	0,000	0,000	0,000
	N	165	165	165	165	165	165
Future potential	Pearson Correlation	.270**	1	.240**	0,050	0,115	.359**
	Sig. (2-tailed)	0,000		0,002	0,517	0,136	0,000
	N	165	165	165	165	165	165
Project Reputation	Pearson Correlation	.379**	.240**	1	.374**	.368**	.505**
	Sig. (2-tailed)	0,000	0,002		0,000	0,000	0,000
	N	165	165	165	165	165	165
Project costs, deadlines and scope	Pearson Correlation	.645**	0,050	.374**	1	.692**	.769**
	Sig. (2-tailed)	0,000	0,517	0,000		0,000	0,000
	N	165	165	165	165	165	165
Project efficiency	Pearson Correlation	.718**	0,115	.368**	.692**	1	.787**
	Sig. (2-tailed)	0,000	0,136	0,000	0,000		0,000
	N	165	165	165	165	165	165
Project sucess total	Pearson Correlation	.953**	.359**	.505**	.769**	.787**	1
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	
	N	165	165	165	165	165	165

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

All of the correlations shown above between the various project success dimensions and the overall project success construct are positive. Most of the correlations can be regarded as significant at the 0.01 level, except for the relationships between future potential and project costs, deadlines & scope, and between future potential and project efficiency.

However, all the project success dimensions are strongly correlated to the overall project success construct as the Pearson's correlation coefficient is above the value of 0.5 and considered significant at the 0.01 level. Except for the correlation between future potential and project success, which is below the 0.5 threshold value but still significant at the 0.01 level. The strongest correlation is between the project benefits & stakeholder satisfaction dimension and the project success construct.

5.5.3 Project success – descriptive statistics

In this section, descriptive statistics are provided for the new five (now excluding project learnings & personal rewards) sub-dimensions of the project success questions used in the research. Using these statistics, a score was calculated for each sub-dimension of project success as the average score for each of the question within the dimension. Test questions and questions not completed were excluded from the data and the calculations. When the score for the project success construct as a whole was calculated, only responses that had all questions answered for that particular construct were taken into account. The "N" column in the table below indicates the number of survey respondents used to create the scores for different project success dimensions.

The number of questions that make up each of the new project success dimension are:

Table 16
Project success question breakdown

Dimension	No. of Questions
Project benefits and stakeholder satisfaction	16
Future potential	2
Project reputation	2
Project costs, deadlines & scope	4
Project efficiency	3
Project success total	27

As mentioned in the research methodology chapter, a 5-point Likert scales was used to score the level of project success which ranged from a score of 1 which indicated that the project was not at all successful, and a score of 5 that indicated the project was very highly successful in terms of the specific question around a facet of the project. The frequency tables as produced for this descriptive statistics section show that respondents generally regarded the individual facets of the ERP projects that they were involved in as favouring highly successful on a scale between moderately successful and highly successful.

Table 17 below shows the summarised descriptive statistics per sub-dimension of project success, and of the project success construct as a whole.

Table 17
Project success descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Project benefits and stakeholder satisfaction	161	1.38	4.94	4.1376	.50517
Future potential	164	2.50	5.00	4.0207	.65773
Project Reputation	163	1.00	5.00	3.1716	.72179
Project costs, deadlines and scope	164	1.00	5.00	3.4610	.76867
Project efficiency	162	1.33	5.00	3.8442	.54710
Project success total	161	1.65	4.68	3.9030	.44266
Valid N (listwise)	156				

The means for each of the dimension of project success ranged from 3.176 to 4.137. This indicates the general view from respondents that their ERP projects were successful. In a review of each histogram per dimension of project success, with a detailed review of the descriptive statistics found that the data of the responses was not widely dispersed around the mean of each dimension, and therefore this mean is a fair representation of the construct.

Each dimension of project success and the overall construct was checked for outliers via the quartile and three standard deviations methods. Based on this, no outliers were identified.

As illustrated in figure 13 below, the mean for the project success construct was calculated to be 3.9. this is considered significantly above the neutral midpoint value of the Likert scale, and indicates that the ERP projects of the sample were successful. This mean was statistically tested using a single population t-test with an unknown population variance to work out if the mean of the population was above the midpoint of the Likert scale used. The results of this

test indicated that there 99% certainty, with a *p*-value less than 0.05 that the population mean is above the neutral Likert scale value of 3.

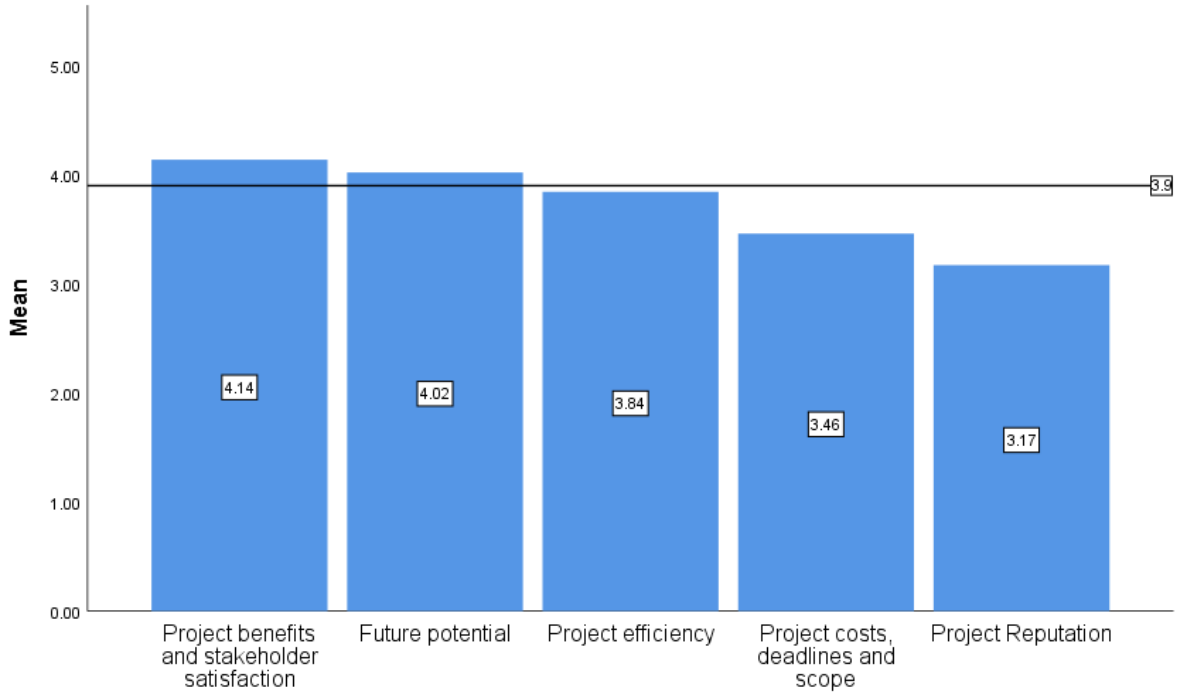

Figure 13. Ranking the means of project success

The dimension for project benefits and stakeholder satisfaction scored the highest mean out of the five possible dimensions. The data was not significantly skewed around the mean. This dimension had, by far, the greatest number of questions within it, with 16, and these questions are considered by the researcher as containing many of the most crucial project success indicators. The project reputation dimension scored the lowest average mean and contained only 2 project success questions within it. The data for this dimension was only slightly positively skewed around the mean.

A shown below, the overall mean for the construct, calculated statistically using a subscale method in order to provide scores per construct for hypothesis testing, is 3.903, indicating that the respondents generally felt that their ERP project can be regarded as successful.

Table 18
Project success construct descriptive statistics

Descriptive Statistics			
	Mean	Std. Deviation	N
Project success total	3,9030	0,44266	156

5.5.4 Demographic influence on project success

In this section, the mean scores for each project success dimension were compared across four of the different demographic groups that the researcher deemed could have an influence on a respondent's answer to the online questionnaire. Thus, multiple one-way analysis of variance (ANOVA) tests were carried out to see if responses differed depending on the demographics.

The summary of the ANOVA tests can be seen in table 19 below:

Table 19
Project success ANOVA results

		***p*-value**
Project benefits & stakeholder satisfaction	Project Position	0,081
	ERP Project Experience	0,083
	Project Duration	0,033*
	Client Sector	0,132
Future Potential	Project Position	0,427
	ERP Project Experience	0,143
	Project Duration	0,000*
	Client Sector	0,388
Project Reputation	Project Position	0,838
	ERP Project Experience	0,632
	Project Duration	0,019*
	Client Sector	0,366
Project costs, deadline & scope	Project Position	0,344
	ERP Project Experience	0,016*
	Project Duration	0,000*
	Client Sector	0,583
Project Efficiency	Project Position	0,074
	ERP Project Experience	0,018*
	Project Duration	0,030*
	Client Sector	0,63

Project Success	Project Position	0,184
	ERP Project Experience	0,052
	Project Duration	0,018*
	Client Sector	0,398

Differences in means uncovered via the ANOVA test are significant if the *p*-value for the test is above 0.05. As can be seen from the table above, project duration has a significant influence of the mean of all the dimensions of project success. The ERP project experience demographic has a significant effect on the project costs, deadline & scope and project efficiency dimensions of project success, but not on the project success construct as a whole.

A single factor ANOVA test is useful in pointing out that there is a significant difference in means across the demographic groups, yet it cannot determine which exact factor within the demographic is influencing the response found for project success variable (Wegner, 2016). Therefore, a post hoc test is conducted which compares the demographic groups in a pairwise fashion with regards to the project success constructs.

An extract of the results for the post hoc test on the project duration demographic are shown in table 20 below. The full details of the post hoc analysis can be seen in appendix 6.

Table 20
Post hoc analysis of project duration

Multiple Comparisons

Scheffe

Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Project benefits and stakeholder satisfaction	1 to 2 years	Over 2 years	.32238*	0,12535	0,039	0,0127	0,6320
Future potential	Under 1 year	1 to 2 years	-.44644*	0,10812	0,000	-0,7135	-0,1794
Project Reputation	Under 1 year	1 to 2 years	.33893*	0,12119	0,022	0,0396	0,6383
Project costs, deadlines and scope	Under 1 year	Over 2 years	.82142*	0,19727	0,000	0,3341	1,3087
	1 to 2 years	Over 2 years	.62925*	0,18524	0,004	0,1717	1,0868

Project efficiency	Under 1 year	Over 2 years	.38332*	0,14435	0,032	0,0268	0,7399
Project success total	Under 1 year	Over 2 years	.31238*	0,11652	0,030	0,0246	0,6002
	1 to 2 years	Over 2 years	.30076*	0,10942	0,025	0,0305	0,5710

*. The mean difference is significant at the 0.05 level.

For the project benefits & stakeholder satisfaction dimension, there was a significant difference between the respondents where the project ran for 1 to 2 years of ERP and over 2 years. For the future potential dimension, there was a significant difference between the respondents where the project ran for under a year and 1 to 2 years. For the project reputation dimension, there was a significant difference between the respondents where the project ran for under a year and 1 to 2 years. For the project costs, deadlines and scope dimension, there was a significant difference between the respondents where the project ran for under a year and over 2 years, and a significant difference between those who responded with 1 to 2 years and over 2 years. For the project efficiency dimension, there was a significant difference between the respondents where the project ran for under a year and over 2 years. Finally, for the project success construct as a whole, there was a significant difference between the respondents where the project ran for under a year of ERP and over 2 years of experience, and a significant difference between those who indicated 1 to 2 and over 2 years.

With regard to the ERP project experience demographic and its effect on the project costs, deadline & scope dimension, the post hoc analysis did not reveal any *p*-values of less than 0.05, but the lowest significance value of 0.056 was found between respondents who had between 0 to 2 years of ERP project experience and 5 to 10 years. In addition, this demographic had a significant effect on the project efficiency dimension, where different responses were recorded from those individuals with zero to 2 years of ERP project experience and over 10 years of ERP project experience.

The significance and reasons behind any of the demographic differences uncovered through the ANOVA tests is discussed in more detail in the next chapter.

5.6 Project governance construct

The questionnaire items for project governance are drawn from the work of Müller and Lecoeuvre (2014). These questions ensure that the two project governance dimensions of shareholder versus stakeholder orientation, and control of behaviour versus outcome approaches, are covered, and they have been utilised successfully in a number of research journals and surveys relating to project management and project governance (Müller & Lecoeuvre, 2014).

As previously mentioned, factor analysis was not suitable for testing the validity of the project governance constructs due to the scale used to measure the answers of the respondents. The scale used required the respondent to choose between which of two statements they related to more in terms of how their organisation and projects are governed. Therefore, within one question there were 2 possible constructs, either the shareholder and stakeholder approaches to governance, or the behaviour control or outcomes control approaches to governance. A single question that has 2 or more possible factors within it cannot be run through any exploratory factor analysis tests. For the same reasons, the construct could not statistically be tested for internal consistency and reliability through the Cronbach's alpha test. Validity of the construct was partially determined through the use of the Pearson's correlation coefficient, however, validity and reliability for the project governance questions and construct was assured through the pervious and successful use and validity testing of the questions in the published works of Müller and Lecoeuvre (2014), Joslin and Müller (2015), and Joslin and Müller (2016).

To statistically analyse the two constructs in this section, the descriptive statistics are presented, followed by a correlation analysis, and analysis of variance tests (ANOVA) to understand the influence of the demographic variables of the survey on the construct in question.

5.6.1 Project governance orientation construct

The construct being statistically analysed in this section is that of project governance orientation. The questions were designed to understand the degree to which individual respondents believed that the governance methods employed by themselves, their company, or the project team on the ERP project in question, are perceived as being inclusive of the objectives of all relevant stakeholder, or more swayed toward looking out for the interests of only the shareholders and owners of the organisation.

The respondents answers were converted to give scores that represent a 5-point Likert scale. Scores with a value of closest to 1 indicates more of a shareholder-oriented approach to governance whereas as scores closer to 5 indicate a stakeholder approach. The survey contained five questions relating to the project governance orientation construct. Please see appendix 4 for a detailed list of the questions within the project governance orientation construct.

5.6.3 Project governance orientation – descriptive statistics

A summarised list of the descriptive statistics for each question of the project governance orientation construct are presented in table 21 below:

Table 21
Project governance orientation questions descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
PG_SH_45	165	1.00	5.00	3.5450	1.20884
PG_SH_46	165	1.00	5.00	2.9320	.86350
PG_SH_47	163	1.00	5.00	3.4744	1.13660
PG_SH_48	164	1.00	5.00	3.6615	.88007
PG_SH_49	163	1.00	5.00	3.1166	1.09293
Valid N (listwise)	161				

The means for each of the questions on project governance orientation ranged from 2.932 to 3.662. In a review of each histogram per question, with a detailed review of the descriptive statistics found that the data of the responses was not widely dispersed around the mean of each question.

Each question for project governance orientation and the overall construct was checked for outliers via the quartile and three standard deviations methods. Based on this, no outliers were identified.

As shown in table 22 below, the overall mean for the project governance orientation construct was calculated to be 3.35. This is considered significantly above the neutral midpoint value of the Likert scale, and indicates a slight inclination of respondents to favour a stakeholder approach to project governance over a shareholder approach.

Table 22
Project governance orientation construct descriptive statistics

Descriptive Statistics			
	Mean	Std. Deviation	*N*
Shareholder vs stakeholder	3,3461	0,83230	161

As displayed graphically in figure 14 below, the project governance orientation question number 48 had the highest mean of the questions with a value of 3.66. The question asked whether profitability or the wider social and ethical interests should determine the legitimacy of actions. Question 46 was based on the set up of the remuneration system at the respondent's organisation, and scored the lowest average of 2.93.

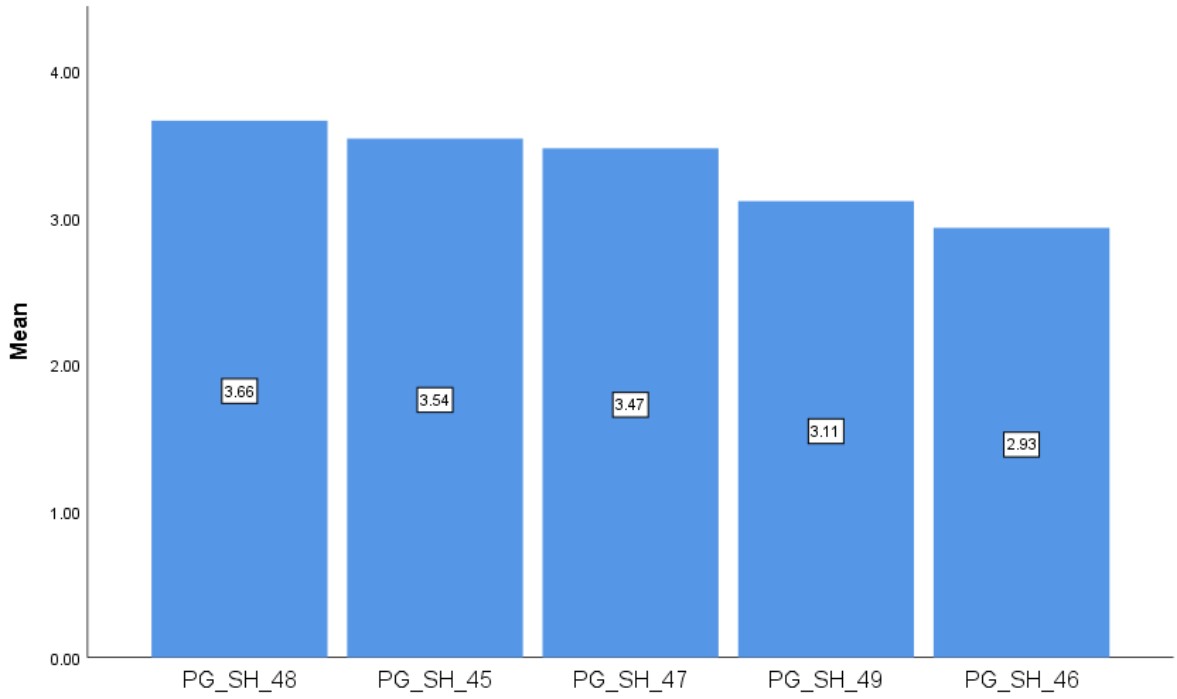

Figure 14. Ranking the means of the project governance orientation questions

5.6.2 Project governance orientation – correlation between items

The Pearson's correlation analysis extracted in table 23 below for the project governance orientation construct is used to understand the relationships between each of the project governance orientation questions.

Table 23
Project governance orientation Pearson's correlation

		PG_SH_45	PG_SH_46	PG_SH_47	PG_SH_48	PG_SH_49
PG_SH_45	Pearson Correlation	1	.574**	.562**	.446**	.503**
	Sig. (2-tailed)		0,000	0,000	0,000	0,000
	N	169	169	168	169	169
PG_SH_46	Pearson Correlation	.574**	1	.512**	.511**	.534**
	Sig. (2-tailed)	0,000		0,000	0,000	0,000
	N	169	169	168	169	169
PG_SH_47	Pearson Correlation	.562**	.512**	1	.574**	.763**
	Sig. (2-tailed)	0,000	0,000		0,000	0,000
	N	168	168	168	168	168
PG_SH_48	Pearson Correlation	.446**	.511**	.574**	1	.531**
	Sig. (2-tailed)	0,000	0,000	0,000		0,000
	N	169	169	168	169	169
PG_SH_49	Pearson Correlation	.503**	.534**	.763**	.531**	1
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	
	N	169	169	168	169	169

**. Correlation is significant at the 0.01 level (2-tailed).

All the Pearson's correlations between each of the project governance orientation construct questions can be considered strong and significant as their values are above 0.5 and significant at the 0.01 level, except for the relationship between questions 45 and 48, yet it is still regarded as significant.

The strongest relationship is between question 47, where the respondent is questioned on what (profitability or stakeholder needs) predominantly determines the legitimacy of organisational and project actions, and question 49, which asks what the long-term objectives of the organisation are. The weakest relationship is of that between question 45, which asks whether shareholder or stakeholder interests determine decisions, and question 48, asking whether the achievement of financial objectives is more important than stakeholder objectives.

5.6.4 Demographic influence on project governance orientation

To assess the potential influence of the demographic variables in the online survey for this research on the answers provided by the respondents on the project governance orientation questions, the mean scores for each of these questions were compared across four of the different demographic groups that the researcher deemed could have an influence on a respondent's answer.

Thus, multiple one-way analysis of variance (ANOVA) tests were carried out to see if responses differed depending on the demographics.

The summary of the ANOVA tests can be seen in table 24 below:

Table 24
Project governance orientation ANOVA summary

	***p*-value**
Project Position	0,094
ERP Project Experience	0,005*
Project Duration	0,026*
Client Sector	0,002*

Differences in means uncovered via the ANOVA test are significant if the *p*-value for the test is above 0.05. As can be seen from the table above, three of the four demographic variables, ERP project experience, project duration, and client sector all have a significant influence on the project governance orientation construct.

A single factor ANOVA test, as carried out above, is useful in pointing out that there is a significant difference in means across the demographic groups, yet it cannot determine which exact grouping within the demographic is influencing the response found for project success variable (Wegner, 2016). Therefore, a post hoc test is conducted which compares the demographic variables and project governance orientation questions in a pairwise fashion.

An extract of the results for the post hoc test on the relevant demographic variables are shown in table 25 below which only shows the significant differences. The full details of the post hoc analysis can be seen in appendix 6.

Table 25
Post hoc analysis for project governance orientation

Multiple Comparisons

Scheffe

Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
ERP Project Experience	0 to 2 years	5 to 10 years	-.76515*	0,21473	0,007	-1,3717	-0,1586
Project Duration	Under 1 year	1 to 2 years	-0,33743	0,14018	0,058	-0,6837	0,0088
Client industry	Other	Government / Mining / Energy	-1.05729*	0,28043	0,032	-2,0657	-0,0489
	Financial Services	Government / Mining / Energy	-.85849*	0,22805	0,033	-1,6785	-0,0385
	Government / Mining / Energy	Manufacturing	.95081*	0,24030	0,019	0,0867	1,8149

*. The mean difference is significant at the 0.05 level.

With regards to the respondent's years of ERP project experience, a significant difference was found in the mean answers on project governance orientation of individuals that had between zero to two years and five to ten years of ERP project experience. This is the most significant difference of all the differences found in the post hoc ANOVA results. For the project duration demographic that was flagged as significant in the initial ANOVA test, in the post hoc results it was found that the difference of mean scores between respondents who indicated that the project duration was under a year and those who indicated it was between one and two years was actually insignificant with a *p*-value of 0.058, which is slightly above the 0.05 threshold.

In relation to the client industry demographic, where respondents indicated the industry that the receiver of the ERP project outcomes belonged to, it was found that there were three combinations that were three differences that were significant at the 0.05 level, but not at the 0.01 level. There were differences in mean sores between other industries (consisting of Agriculture, Other, Security, Services, and Tourism) and government, mining and energy production industries. Government, mining and energy production industry score were also significantly different at the 0.05 level to the financial services industry. Finally, Government, mining and energy production industry score were also significantly different to the

manufacturing industry, with this difference being the most significant, at a level of 0.019, of the three differences caused by the client industry demographic.

The significance and reasons behind any of the demographic differences uncovered through the ANOVA tests is discussed in more detail in the next chapter.

5.6.6 Project governance control construct

The survey questions on project governance are drawn from the work of Müller and Lecoeuvre (2014). The specific project governance construct presented in this section is that of control. The construct sought to understand from the questionnaire respondents, to what degree they have perceived that the control structures employed by their organisations and on projects are either more heavily behaviour and process controlled versus control structures that are more outcomes based.

To statistically analyse the construct in this section, the descriptive statistics are presented, followed by a correlation analysis, and analysis of variance tests (ANOVA) to understand the influence of the demographic variables of the survey on the construct in question.

Please see appendix 5 for a detailed list of the questions within the project governance control construct.

5.6.7 Project Governance control – descriptive Statistics

A summarised list of the descriptive statistics for each question of the project governance control construct are presented in table 26 below:

Table 26 *Project governance control descriptive statistics*

	N	Minimum	Maximum	Mean	Std. Deviation
PG_BC_50	165	1.00	5.00	2.8964	1.14173
PG_BC_51	165	1.00	5.00	2.5542	1.20009
PG_BC_52	164	1.00	5.00	3.3822	.94291
PG_BC_53	164	1.00	5.00	3.0815	.81774
PG_BC_54	165	1.00	5.00	3.4976	1.02591
Valid N (listwise)	164				

The means for each of the questions on project governance control ranged from 2.55 to 3.50. In a review of each histogram per question, with a detailed review of the descriptive statistics found that the data of the responses was not widely dispersed around the mean of each question.

As shown in table 27 below, the overall mean for the project governance orientation construct was calculated to be 3.08. This is considered noticeably very close to the neutral midpoint value of the Likert scale, and indicates an indifference of respondents between the process or behavioural control approach to project governance and the outcomes-based approach.

Table 27
Project governance control construct descriptive statistics

	Mean	Std. Deviation	*N*
Behaviour vs outcome control	3,0845	0,78374	164

As displayed graphically in figure 15 below, the project governance orientation question number 54 had the highest mean of the questions with a value of 3.49. The question asked whether methodology compliance or people's own experiences was prioritised when getting project work done. Question 51 was around the type of controls in place in the organisation and on the project, and scored the lowest average mean of 2.55.

Figure 15. Ranking the means of the project governance control questions

5.6.8 Project governance control – correlation between items

The Pearson's correlation analysis extracted in table 28 below for the project governance orientation construct is used to understand the relationships between each of the project governance orientation questions.

Table 28
Project governance control Pearson's correlation

Correlations

		PG_BC_50	PG_BC_51	PG_BC_52	PG_BC_53	PG_BC_54
PG_BC_50	Pearson Correlation	1	.645**	.510**	.303**	.586**
	Sig. (2-tailed)		0,000	0,000	0,000	0,000
	N	169	168	169	168	169
PG_BC_51	Pearson Correlation	.645**	1	.608**	0,138	.460**
	Sig. (2-tailed)	0,000		0,000	0,075	0,000
	N	168	168	168	167	168
PG_BC_52	Pearson Correlation	.510**	.608**	1	.296**	.598**
	Sig. (2-tailed)	0,000	0,000		0,000	0,000
	N	169	168	169	168	169
PG_BC_53	Pearson Correlation	.303**	0,138	.296**	1	.448**
	Sig. (2-tailed)	0,000	0,075	0,000		0,000
	N	168	167	168	168	168
PG_BC_54	Pearson Correlation	.586**	.460**	.598**	.448**	1
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	
	N	169	168	169	168	169

**. Correlation is significant at the 0.01 level (2-tailed).

Most of the Pearson's correlations between each of the project governance control construct questions can be considered strong and significant as their values are above 0.5 and significant at the 0.01 level. Except for the relationship between questions 51 and 54 with a Pearson's correlation coefficient of 0.46, yet it is still regarded as statistically significant, and the relationship between questions 50 and 53with a value of 0.303, but it is still considered statistically significant. The relationship between questions 51 and 53 is considered weak with a value of 0.138 and insignificant.

The strongest relationship is between question 50, where the respondent is questioned on the management philosophy and approach to formally laid down procedures, and question 51, which asks the controls in place for the organisation and on ERP projects. The weakest relationship is of that between question 51 and question 53, which asks about the main aim of their project support institutions.

5.6.9 Demographic influence on project governance control

To assess the potential influence of the demographic variables in the online survey for this research on the answers provided by the respondents on the project governance control questions, the mean scores for each of these questions were compared across four of the different demographic groups that the researcher deemed could have an influence on a respondent's answer.

Thus, multiple one-way analysis of variance (ANOVA) tests were carried out to see if responses differed depending on the demographics.

The summary of the ANOVA tests can be seen in table 29 below:

Table 29
Project success control ANOVA results

	***p*-value**
Project Position	0,235
ERP Project Experience	0,48
Project Duration	0,242
Client Sector	0,178

Differences in means uncovered via the ANOVA test are significant if the *p*-value for the test is above 0.05. As can be seen from the table above, none of the demographic variables had a significant influence on the project governance control construct questions, and thus no post hoc ANOVA analyses were conducted.

5.8 Hypotheses testing

Regression analysis was performed to test the research hypotheses at a significance level where the *p*-value is less than 0.01. The purpose of the regression analysis was to understand if project governance has a relationship with ERP project success as per the high-level research hypothesis stating that the project governance methods adopted on ERP projects is associated with that project's success. This overall research hypothesis was broken down into two more specific hypotheses by separating project governance into two of its possible methods being that of project governance orientation (shareholder versus stakeholder) and project governance control (behaviour versus outcome).

Regression modelling was used to not only test if correlation exist between the relevant constructs, but also to test of the relationship can be quantified.

Prior to running any regression analyses, the assumptions of regression were tested via the normality of residuals test to ensure that are no significantly influencing outliers in the predicted values. The assumptions of homoscedasticity and linearity were also tested. The results of the regression test for each of the two hypotheses are presented in this section by displaying by stating the null and alternate hypotheses for each of the two research scenarios. The statistical regression results are then shown in their standardised format, via regression tables, and lastly the results are presented visually via a scatterplot.

5.8.1 Hypotheses one – project success & project governance orientation

The hypothesis for the correlation between project governance orientation and ERP project success was formulated in the literature review of this research and presented in Chapter 3. The hypothesis states that a project governance process that favours a stakeholder approach is positively correlated with successful project outcomes. A stakeholder versus a shareholder approach to project governance entails that the approach is perceived as being focused on the objectives of all relevant stakeholders, or more swayed toward looking out for the interests of only the shareholders and owners of the organisation.

The null and alternate hypotheses can be formally stated as:

Null Hypothesis: $\mathbf{H_0}$: There is no statistically significant positive relationship between the stakeholder form of project governance and project success.

Alternate Hypothesis: $\mathbf{H_1}$: There is a statistically significant positive relationship between the stakeholder form of project governance and project success.

Through testing the assumptions of regression via the normality of residuals test to ensure that are no significantly influencing outliers in the predicted values, no major influential outliers were found. The assumptions of linearity and homoscedasticity were tested and found be acceptable.

The results of the regression tests are presented in table 30 below:

Table 30
Regression model statistics for project governance orientation hypothesis

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.372[a]	0,138	0,133	0,41215
a. Predictors: (Constant), Shareholder vs stakeholder				
b. Dependent Variable: Project success total				
Correlations				
			Project success total	Shareholder vs stakeholder
Pearson Correlation		Project success total	1,000	0,372
		Shareholder vs stakeholder	0,372	1,000
Sig. (1-tailed)		Project success total		0,000
		Shareholder vs stakeholder	0,000	
N		Project success total	156	156

		Shareholder vs stakeholder		161	161	
ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4,552	1	4,552	26,795	.000[b]
	Residual	28,368	159	0,170		
	Total	32,920	160			
a. Dependent Variable: Project success total						
b. Predictors: (Constant), Shareholder vs stakeholder						

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3,241	0,132		24,609	0,000		
	Shareholder vs stakeholder	0,198	0,038	0,372	5,176	0,000	1,000	1,000
a. Dependent Variable: Project success total								

The above linear regression test was performed to tests if there is a significant relationship between project governance orientation and ERP project success, but also to see if this

relationship could be quantified and modelled. The output of the regression results shows that a significant regression equation was found (F(1,159) = 26.795, with *p*-value of less than 0.001), and an R-square value of 0.133.

Similarly, the Pearson's correlation coefficient (or the standardised coefficient of shareholder vs stakeholder) of 0.372 indicates that project governance orientation is moderately correlated to ERP project success. The adjusted R-square value in the results describes that project governance orientation explains 13.8% of the variance in ERP project success (the dependent variable.

In addition, the regression coefficient for project governance orientation (stakeholder vs shareholder) shows that for every single unit increase in project governance orientation, the predicted value for ERP project success should increase by 0.198 in value. This regression coefficient can be regarded as significant with a *p*-value of less than 0.001.

The null hypothesis is therefore rejected at the 1% level of significance in favour of the alternate hypothesis stating that there is a statistically significant positive correlation between the stakeholder form of project governance and project success.

The ERP project success prediction equation for the relationship can be stated as [ERP Project Success = 3.241 + 0.198*Project Governance Orientation]. This equation can also be visually presented as in figure 16 below:

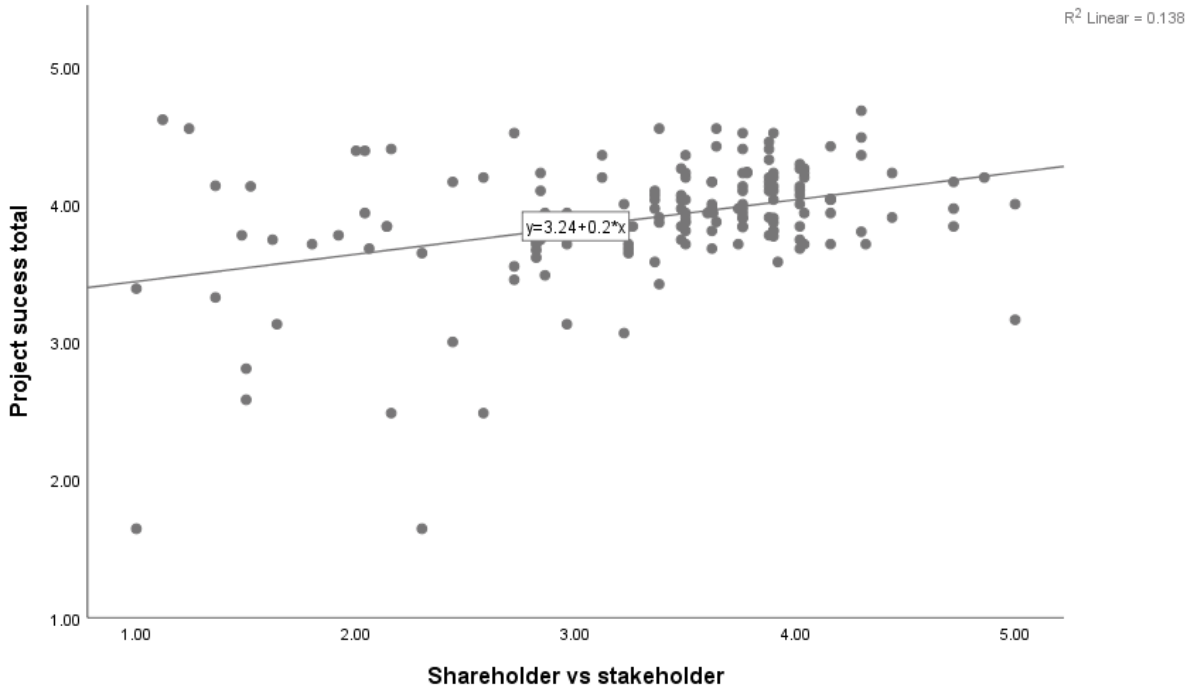

Figure 16. Scatterplot of project governance orientation and project success regression model

5.8.2 Hypotheses two – project success & project governance control

The hypothesis for the correlation between project governance control and ERP project success was formulated in the literature review of this research and presented in Chapter 3. The hypothesis states that a project governance process that favours behavioural and strict process control will have a positive relationship with successful project outcomes. A control approach to project governance entails that the approach is perceived that the control structures employed by their organisations and on projects are either more heavily behaviour and process controlled versus control structures that are more outcomes based.

The null and alternate hypotheses can be formally stated as:

Null Hypothesis: $\mathbf{H_0}$: There is no statistically significant positive relationship between the process / behaviour-controlled form of project governance and project success.

Alternate Hypothesis: $\mathbf{H_1}$: There is a statistically significant positive relationship between the process / behaviour-controlled form of project governance and project success.

Through testing the assumptions of regression via the normality of residuals test to ensure that are no significantly influencing outliers in the predicted values, no major influential outliers were found. The assumptions of linearity and homoscedasticity were tested and found be acceptable.

The results of the regression tests are presented in table 31 below:

Table 31
Regression model statistics for project governance control hypothesis

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.058[a]	0,003	-0,003	0,44324
Correlations				
		Project success total	Behaviour vs outcome control	

Pearson Correlation	Project success total	1,000	0,058
	Behaviour vs outcome control	0,058	1,000
Sig. (1-tailed)	Project success total		0,227
	Behaviour vs outcome control	0,227	
N	Project success total	169	169
	Behaviour vs outcome control	169	169

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0,111	1	0,111	0,564	.454[b]
	Residual	32,809	162	0,196		
	Total	32,920	163			

a. Dependent Variable: Project_success Project success total

b. Predictors: (Constant), Behaviour_outcome Behaviour vs outcome control

Coefficients[a]

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.	Collinearity Statistics

		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3,802	0,139		27,384	0,000		
	Behaviour vs outcome control	0,033	0,044	0,058	0,751	0,454	1,000	1,000
a. Dependent Variable: Project_success Project success total								

The above linear regression test was performed to tests if there is a significant relationship between project governance control and ERP project success but also to see if this relationship could be quantified and modelled. The output of the regression results shows that no significant regression equation was found as ($F(1,162) = 0.564$, with *p*-value of greater than 0.05), and an R-square value of 0.003.

Similarly, the Pearson's correlation coefficient (or the standardised coefficient of behaviour vs outcome control) of 0.058 indicates that project governance has no correlation to ERP project success. The adjusted R-square value in the results describes that project governance control explains almost none of the variance in ERP project success (the dependent variable).

In addition, the regression coefficient for project governance control (stakeholder vs shareholder) shows that for every single unit increase in project governance orientation, the predicted value for ERP project success should increase by 0.03 in value. This regression coefficient can be regarded as insignificant with a *p*-value of greater than 0.05.

This second hypothesis is not supported as there is no statistically significant positive correlation at the 5% significance level between the process and behaviour form of project governance and project success. The null hypothesis is therefore accepted.

The ERP project success prediction equation for the relationship can be stated as [ERP Project Success = 3.802 + 0.033*Project Governance control]. This equation can also be visually presented as in figure 17 below:

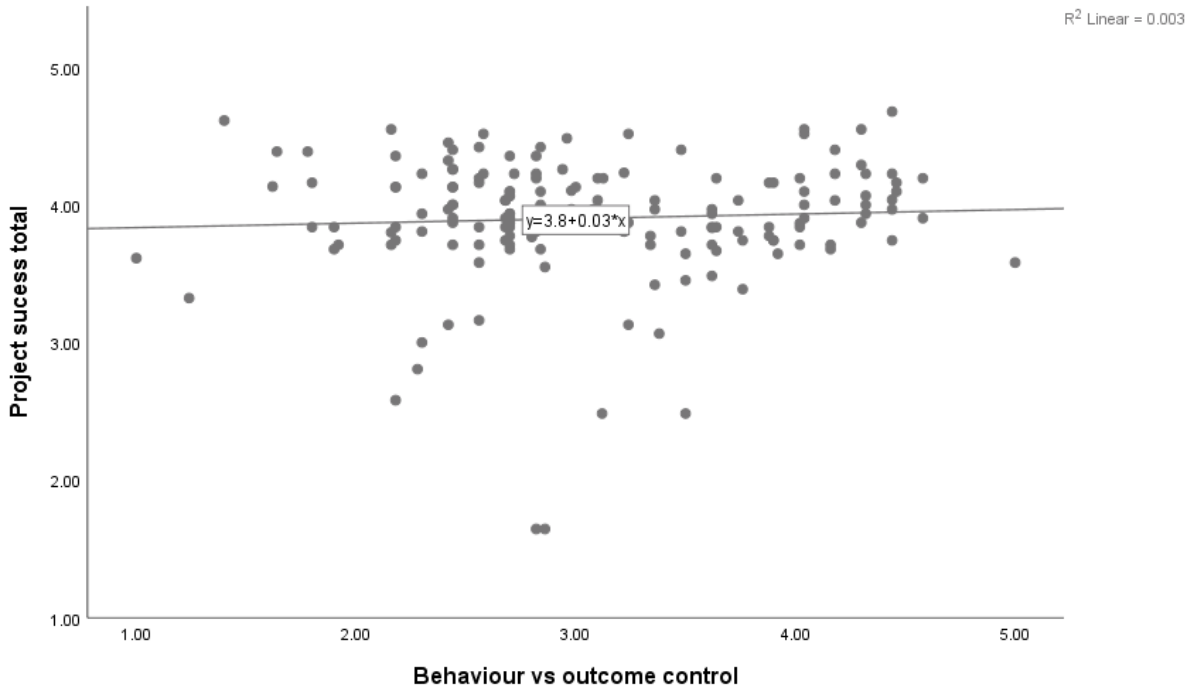

Figure 17. Scatterplot of project governance control and project success regression model

5.9 Five dimensions of project success and project governance orientation

I light of the hypothesis testing in the previous section, and the result that indicates that project governance orientation has a relationship with ERP project success, a correlation analysis was conducted between each of the new ERP project success dimensions and the project governance orientation construct, as shown in table 32 below.

Table 32
Correlation of the project success dimensions with project governance orientation

Correlations

		Shareholder vs stakeholder	Project benefits and stakeholder satisfaction	Future potential	Project Reputation	Project costs, deadlines and scope	Project efficiency	Project sucess total
Shareholder vs stakeholder	Pearson Correlation	1	.418**	.171*	-.199**	.249**	.347**	.372**
	Sig. (2-tailed)		0,000	0,026	0,009	0,001	0,000	0,000
	N	164	164	164	164	164	164	164
Project benefits and stakeholder satisfaction	Pearson Correlation	.418**	1	.270**	.379**	.645**	.718**	.953**
	Sig. (2-tailed)	0,000		0,000	0,000	0,000	0,000	0,000
	N	164	164	164	164	164	164	164
Future potential	Pearson Correlation	.171*	.270**	1	.240**	0,050	0,115	.359**
	Sig. (2-tailed)	0,026	0,000		0,002	0,517	0,136	0,000
	N	164	164	164	164	164	164	164
Project Reputation	Pearson Correlation	-.199**	.379**	.240**	1	.374**	.368**	.505**
	Sig. (2-tailed)	0,009	0,000	0,002		0,000	0,000	0,000
	N	164	164	164	164	164	164	164
Project costs, deadlines and scope	Pearson Correlation	.249**	.645**	0,050	.374**	1	.692**	.769**
	Sig. (2-tailed)	0,001	0,000	0,517	0,000		0,000	0,000
	N	164	164	164	164	164	164	164
Project efficiency	Pearson Correlation	.347**	.718**	0,115	.368**	.692**	1	.787**
	Sig. (2-tailed)	0,000	0,000	0,136	0,000	0,000		0,000
	N	164	164	164	164	164	164	164
Project sucess total	Pearson Correlation	.372**	.953**	.359**	.505**	.769**	.787**	1
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	
	N	164	164	164	164	164	164	164

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation findings show that project governance orientation is mostly positively correlated with the project benefits and stakeholder satisfaction dimension of ERP project success, and least positively correlated with the future potential dimension. Whilst project governance orientation is negatively correlated with project reputation.

These results are also displayed graphically in figure 18 below and discussed in detail in the next chapter.

Figure 18. Correlation graphic of the project success dimensions with project governance orientation

5.10 Conclusion

The research findings contained within this chapter provided some interesting results extracted from the data collected from the sample of respondents to the survey. The demographics of the respondents showed the majority were male and had the relevant amount of work and ERP experience to be able to provide insightful answers to the survey.

The mean value for the project success construct came out slightly higher than expected, with the project governance orientation construct values indicating a stakeholder approach to governance on ERP projects, but the results for the project governance control construct showed that the respondents were indifferent.

The regression modelling results for hypothesis 1 show the existence of a moderate but significant relationship between project governance orientation that is swayed towards a stakeholder approach and ERP project success, whereas for hypothesis 2, no relationship exists between the project governance control mechanisms and ERP project success.

The findings presented in this chapter are discussed in further detail in chapter 6.

6 Discussion

6.1 Introduction

Through the data gathering process for this research as outlined in section 4.7, a response rate of just over 20% was achieved from the 800 potential respondents whom were sent an e-mail. Roughly 50 more surveys were responded to than expected by the researcher, which indicates an interest in the topic amongst ERP professionals and ERP project participants. The relevant statistical tests were then carried out on the gathered data, were it was firstly formatted, and the measurement instrument was assessed on its reliability. All of the constructs were also validated for their questions relevance and validity in measuring these constructs.

Thus, the rest of this chapter is a discussion around the results of the research. It commences by going through the demographics of the sample in order to highlight the profile and variety of the respondents. This section then makes interpretations based on the statistical test results conducted on each of the constructs relevant to the research hypotheses of analysing the correlation between project governance methods and ERP project success. The constructs, as formulated in chapter 2, are project success, subdivided in into five separate sub- headings of project efficiency, organisational benefits, project impact, future potential, and stakeholder satisfaction (Khan et al., 2013), and project governance, separated into two of its many possible methods (the orientation of favouring the shareholder versus favouring all stakeholders and the method of strict behavioural or process control versus outcomes or achievements-based approach).

This section then moves onto a discussion surrounding the finding of the research hypotheses. This section was aimed at providing insights into the relationship between project governance and ERP project success by regressing project governance into the two independent variables of Governance Orientation (shareholder versus stakeholder) and Governance Control (process / behaviour versus outcome), to assess their ability in predicting the dependent variable being Project Success.

The overall purpose of this chapter was to provide a comprehensive reasoning or an understanding behind the statistical results, with an effort to expand on and highlight some of the more exciting findings from the study.

6.2 Sample demographics

The respondents to the survey for this research consisted of a sample of 169 people whom have all been involved, in either way of eight different possible roles, in the implementation or execution of a large-scale ERP project at a corporate client in South Africa. All participants to the survey selected one of the eight project roles listed on the questionnaire, with no one selecting the option for other, thus making them all legitimate and valid participants in the research. The participants had a total of 11 different demographic questions to answer. This gave the researcher the ability to highlight any interesting demographic outcomes, but more importantly, it allowed for the research results to be tested against the sample demographics and ascertain if any difference in these categorical variables had a significant influence on the responses received, and thus affecting the research due to the existence of non-spurious variables that may distract from the cause and effect relationship between project governance and ERP project success (Van de Ven, 20017).

In order to test if these demographic variables do have an influence on the relevant construct score, it was first necessary to understand the fragments and proportions relating to the demographics of the sample. The sample consisted of 169 total respondents, with only a few participants leaving one of the eleven demographic options blank. The results indicated that there was a strong gender bias as 116 (over 70%) of the 165 usable respondents were male. Therefore only 29% of the respondents identified as being female. Although this represents a large difference, it can be said to be a fair representation of the information technology industry with the World Economic Forum (2016) reporting that the industry was made up of roughly 21% of females. The difference between the WEF report and this research can be put down to the fact that this research did not only have IT industry professionals as survey participants, but also other project roles where that person may be a part of a different industry.

Work and industry experience of the sample was assessed in two ways. Firstly, respondents were asked how many years of working experience they had. The largest selections for this demographic were the 77% of respondents who selected 5 to 10 years or 10 to 20 years as their answer. This figure insists that the respondents were fairly experienced from an employment perspective. Similarly, the respondents were asked to indicate the years of experience on ERP projects. 126 (65%) of the participants responded that they had either 5 to 10 years or 10 to 20 years of ERP experience. Whilst this figure is considered encouraging by the researcher as most of the respondents have a sufficient amount of ERP experience and should therefore provide some valuable and accurate insight to this research, but it is also not expected as it is rare that an individual is placed on an ERP project within their first year of working, as a certain amount of training and experience is required first.

The next set of demographic questions were focused on attributes of the ERP project on which the participants were being surveyed. The two most common positions that participants held on the ERP projects in question were the roles of ERP professional or consultant (38,6%) and project manager (26,5%). This again shows that almost two thirds of the research participants had vast knowledge of ERP systems and projects, with the project managers most likely to be able to provide relevant insight regarding how the projects were governed as they are responsible for ensuring that the governance principles and methods, as required by the client, are implemented and adhered to.

There was a diverse mix of the different types of industries selected (11 different industries) by the respondents in terms of the industry in which the organisation that incurred the ERP project costs belongs to. Only 4 (2%) respondents selected the 12th industry option which was other. The four that account for most of the industries selected are financial services (20%), wholesale or retail trade (20%), ICT (16%), and manufacturing (15%). These demographics make logical sense due to a number of factors.

Firstly, in the original target population of 800 potential respondents to the survey, the researcher had access to individuals who were part of ERP projects at 2 large financial intuitions, and 3 large retail chains in South Africa. Secondly, the substantial size of the 5 leading financial institutions in South Africa, and the fact the World Economic Forum has consistently ranked South Africa's financial system as one of the best in the world according to their global competitiveness index, has created a requirement for these organisations to run the top ERP systems in order to maintain these systems and tight controls. Thirdly, as mentioned in chapter 2, ERP systems were originally created for the Manufacturing and Retail sectors (Zhu et al., 2010). And lastly, an ERP system is an ICT product, and so it makes sense that organisations in the ICT sector would be running an advanced ERO system and ICT product in order to run their business and maintain a competitive edge.

The researcher had no reason to believe that the mixture and different weights of the industries represented within the sample of respondents would create any potential biases within the study. Accordingly, when analysis of variance tests were conducted for each construct and compared across the different industries in chapter 5, there was only one statistically significant difference that resulted from one of the industries, and is discussed later in this chapter.

Respondents indicated that 72% of the ERP projects in question were carried out in the City of Johannesburg. This is due to the research having lived and worked most of his life in Johannesburg, with his work contacts for the survey also being from Johannesburg, and the

ERP service providing firms that helped in creating the sample of respondents also residing in Johannesburg.

The next 2 demographic variables sought to measure the level of project urgency and complexity. The projects were generally of medium urgency, but a mixture of medium and high in complexity. This is somewhat expected as sophisticated ERP systems are generally complex in nature, and the processes required on the project in order to customise the software to each individual organisations differing needs in requirements and how the organisations are run further contribute to the complexity of the project (Zhu et al., 2010). The projects are of medium urgency as the organisations would not stop operating or cease to exist without the software, it is rather that the software should provide the organise with increased efficiency, controls, and a competitive edge.

The respondents indicated that the costs of completing the ERP projects in question varied based on the sections given to them in the survey with no cost range being selected a great deal more than any other cost range. However, based on the selections of this demographic, it can be confirmed that ERP projects are very expensive endeavours, and so the decision to embark on these projects must be taken seriously, and the successful outcome of the project must be pursued and prioritised (Ehie & Madsen, 2005).

The final categorical question was used to understand what type of organisational structure was adopted by the client at which the ERP project was executed. An organisation that is solely structured as projectized (organizations arrange their activities into programs or portfolios and implement them through projects) is by far the least prevalent at organisations that run ERP systems in South Africa. It is therefore felt by large South African organisations that either a functional / hierarchical structure of a mixture between a functional and projectized organisation is the most efficient and effective within the South African context.

Thus, the sample population for this research (which can be assumed to be a fair representation of the target population due to the use of a purposive sampling method and the size of the surveyed sample) can best be described as individuals as more male oriented, with enough level of ERP project experience.

6.3 Project success construct

The combination of questions is based on the work by Khan et al. (2013) as they studied all the most recent and relevant literature on project success to identify the key success factors that exist, and then separate these factors into 5 different sub dimensions based on certain commonalities between factors. These success factors were successfully converted into questions that were used in research questionnaires in the studies by Joslin and Müller (2015) and Joslin and Müller (2016). However, all these studies focused on projects in general and around the world, regardless off type of project, for which industry, and which country. This research is focused on ERP projects specifically, and therefore some minor wording changes were made to the questions to make them ERP project specific.

In at least seven separate project success related academic studies carried out by either Joslin or Müller over the last decade, the project success questions were grouped and factored into the five dimensions as per the suggestions of Khan et al. (2013). However, for this study, an exploratory factor analysis run for all the 32 possible project success question revealed that for this research six project success factors can be utilised. These newly identified factors were assessed for the themes they have in common and these new dimensions were according named project success, future potential, project reputation, project learnings & personal rewards, project efficiency, and finally, project costs, deadlines & scope.

However, following a Cronbach's alpha test on the project success construct to test for internal consistency and reliability, it was decided to remove the newly created project learning & personal rewards construct as it had an unacceptable reliability measure. The four questions within this dimension were therefore not considered in any further statistical analysis. As these questions were of the theme of learnings and personal rewards, they can be seen as not as crucial as other questions that ascertain if a project is successful or not, and are definitely not crucial to ERP projects specifically (Baykasoğlu & Gölcük, 2017).

Seeing as though the previous studies of either Joslin or Müller on project success looked at any type of project, regardless of scale or type, it must then be argued that these newly grouped project success dimensions may be more suited to investigate project success for ERP projects specifically. It certainly builds on the work by Wang and Chen (2006) whom only asked their respondents to answer five individual questions on whether or not the ERP project was successful or not.

The project success construct as a whole in the study by Joslin and Müller (2016) obtained a mean score of 3.81 using a 5-point Likert-scale, the study by Serrador and Turner (2015)

achieved a score of 3.33, whereas the study by Wang and Chen (2006), which included a specific construct on ERP projects success, obtained a mean of 3.17. Similarly, in this study a mean score for the construct of 3.9 was achieved, indicating that the survey respondents generally felt that their ERP projects achieved success. The study by Fitz-Gerald and Carroll (2003) suggested that around a quarter of all ERP projects failed on key project success factors such as running over budget and not finishing on time. Therefore, it was not irrational for the researcher to believe, at the outset of this study, that the mean score for the project success construct would be lower than that of Joslin and Müller (2016) and Serrador and Turner (2015), as this study focused on ERP projects, and not projects in general.

When assessing the ERP project success construct by splitting it up into its separate dimensions, it was seen that while all the dimensions scored above the average on the midpoint of the Likert-scale (indicating project success), it was the project benefits and stakeholder satisfaction dimension that scored the highest mean, with project reputation scoring the lowest. Interestingly, the former dimension contained 16 questions that contain, arguably, the most pertinent and universal factors for determining project success for any type of project (Mabert et al., 2001), whereas the project reputation dimension represents a type of fringe benefits scenario, and is not the main aim of the project. Overall, it can be concluded that ERP projects executed at large south African organisations have been generally quite successful.

In addition, through a Pearson's correlation coefficient test to assess the relationship amongst all of the newly formed ERP project success constructs, it was only the future potential dimension that did significantly correlate with the project costs, deadline & scope dimension and the project efficiency dimension. However, all project success dimensions were significantly correlated with the project success construct as a whole, giving further credibility to the questions making up the construct (Serrador & Turner, 2015).

Further statistical analysis was performed on the construct in terms of multiple one-way ANOVA tests to determine if responses differed for the questions within the ERP project success construct depending on the demographics. Through this test and a post hoc analysis, it was found that there 8 significant (at the 0.05 level) scenarios where the project duration demographic had influenced the answers of the respondents. ERP project experience only brought about two such influencing scenarios.

For the project duration demographic, it was interesting to note that generally it was the individuals whose projects ran for over two years whom indicated that the project was less successful than their counterparts whose projects ran for a duration of less than two years.

From the researcher's experience and from the viewpoint of ERP software providing firms, an ERP implementation or large-Scale ERP project consisting of one or two modules should not take over two years to implement. The average for these projects should be around a year to 18 months. The respondents have therefore shown in their answers that ERP projects than exceed the two-year duration mark will be perceived, and most likely are, less successful that projects implemented within a shorter duration (Mabert et al., 2001).

Complimentary to this, the project duration demographic had the largest and most significant effect on the project costs, deadlines & scope dimension of ERP project success. The most likely possible explanation for this is that projects that run longer in duration run the high risk of exceeding the project budget, the original timelines, and the scope of work that needs to be completed, which are all relatively critical factors of a success if achieved, and therefore these ERP projects of longer duration are less successful (Atkinson, 1999).

With regards to the effect of the ERP experience demographic on the ERP projects success responses, the analysis of the post hoc ANOVA analysis revealed that the difference in responses between respondents whom had zero to two years of experience and those with over ten years of experience had a significant influence on the project efficiency dimension of project success. Interestingly, it is the respondents with more experience who perceived their projects as being more successful, which was in line with the work of (Shanks, 2000).

This may be due to the biases of the less experienced individuals whom may have expected better results from the first one or two projects that they have been involved in, or that they possibly have doubted themselves and they work they performed more than they probably should of. But it is also very likely that those with more project experience have a better understanding of what constitutes a successful project or not, and their opinion, arguably should be taken slightly more seriously, and the opinion of the more experienced individuals is that the ERP projects are more successful in the end than the projects where less experienced individuals were involved. A spin off to this notion, and supported by the research survey results, is that it could be that projects that have the expertise of more experienced individual to work on it, have a higher chance of attaining project success than those ERP projects that employ the services of less experienced individuals.

6.4 Project governance construct

The project governance questions were adapted from the work of Müller and Lecoeuvre (2014) whom developed a categorisation system for how projects are governed based on where governance and organisation theory are interlinked with management theories. According to their version of the project governance construct, governance methods employed on projects can take on many forms but can be summarised as leaning towards two out of four specific paradigms. Hence, project governance either favours the needs and interests of only the shareholder and owners of an organisation, or it can take into account the interests of all stakeholders, and the governance method can either be strictly controlling over processes and behaviours, or it can be more trusting in the experience and abilities of the project teams in achieving the desired project outcomes as best they see fit.

Project governance is thus broken up into project governance orientation (shareholder versus stakeholder) and project governance control (process / behaviour versus outcomes) (Müller & Lecoeuvre, 2014).

Factor analysis was not suitable for testing the validity of the project governance constructs due to the scale used to measure the answers of the respondents. The scale used required the respondent to choose between which of two statements they related two more in terms of how their organisation and projects are governed. Therefore, within one question there were 2 possible constructs, either the shareholder and stakeholder approaches to governance, or the behaviour control or outcomes control approaches to governance. A single question that has 2 or more possible factors within it cannot be run through any exploratory factor analysis tests. Validity for the project governance questions and construct was assured through the previous and successful use and validity testing of the questions in the published works of Müller and Lecoeuvre (2014), Joslin and Müller (2015), and Joslin and Müller (2016).

Answers by the survey respondents were converted to numeric scores that fell along a 5-point Likert-scale. The project governance constructs were tested through descriptive statistics, a correlation analysis, and ANOVA tests to assess the influence of demographic survey variable on the respondents answers to the project governance questions.

6.4.1 Governance orientation – shareholder versus stakeholder

The project governance orientation questions, adopted form Müller and Lecoeuvre (2014), were designed to understand the degree to which individual respondents believed that the governance methods employed by themselves, their company, or the project team on the ERP project in question, are perceived as being inclusive of the objectives of all relevant stakeholder, or more swayed toward looking out for the interests of only the shareholders and owners of the organisation. The questions were adapted from their study by making them more ERP project specific for this research rather than for any general organisational project.

In converting the survey respondents answers for the project governance orientation construct into numeric values along a 5-point Likert-scale, an answer closer to the value of 1 indicates a shareholder orientated approach to governance, whereas a value closer to 5 indicates a stakeholder orientated approach to governance.

A Pearson's correlation coefficient test on the construct revealed that the correlations amongst each of the project governance orientation questions (appendix 4) can be considered strong and significant, giving credibility to the relevance of the questions and the construct as a whole (Wegner, 2016).

The mean score of the construct, measured at 3.35 with a standard deviation of 0.83, showed that the average respondent indicated that in their organisation a governance and project governance approach is taken that favours the stakeholder orientation. By analysing the three project governance orientation questions that obtained the highest individual means, it can be said that respondents therefore generally believe that their organisation requires them to sometimes sacrifice financial objectives in the pursuit of improving stakeholder satisfaction, that decisions are generally made in the bests interests of the wider stakeholder community, and there prevails the notion that wider social and ethical interests govern the acceptability of business and project actions.

The statistical results for this construct are complimentary to the conclusions around project governance orientation found in the study by Müller and Lecoeuvre, 2014, whom also uncovered that the respondents to their surveys indicated that their organisation were more stakeholder oriented than shareholder oriented.

The calculated means in this study for the project success and project governance orientation constructs therefore supports the research findings of Eskerod and Vaagaasar (2014) who showed that taking into account the interests of the relevant stakeholders to a particular project

is a highly important factor in the entire project process that ultimately determines whether that project is successful or not.

Switching focus to the studies of Joslin and Müller (2015), Joslin and Müller (2016), Müller and Lecoeuvre (2014) and Serrador and Turner (2015), the respondents to this research were made up primarily of respondents in the positions of program managers and project managers executing relatively high value projects of any type in the northern hemisphere. Whereas the respondents for this survey are generally made up of ERP professionals and project managers working with large organisations in South Africa. It stands to reason then that ERP projects executed in South Africa are governed with a higher degree of stakeholder orientation then those of general projects in the northern hemisphere, as evidenced by the by the lower mean for project governance orientation calculated by Joslin and Müller (2016) and Müller and Lecoeuvre (2014).

Further statistical analysis was performed on the construct in terms of multiple one-way ANOVA tests to determine if responses differed for the questions within the project governance orientation construct depending on the demographics. Initial testing indicated that the demographic variables of ERP project experience, project duration, and client sector all had a significant influence on the responses received within the construct. Post hoc analyses were therefore conducted to drill down into the exact causes for these possible differences.

The post hoc analysis on ERP project experience revealed that individuals with five to ten years of experience were more inclined to respond that their projects were more oriented towards a stakeholder governance approach, with a mean of 3.53, than their counterparts with xero to two years of ERP project experience, scoring a mean value of 2.77 for the construct, indicating that they are of the impression that more of a shareholder approach to governance is favoured within their organisations and on projects.

A possible explanation for this difference could be that the individual members on an ERP project team with the least amount of experience (i.e. from zero to two years) will be assigned less senior project roles compared to those with more experience. A less senior role usually translates to the salary for that role being less in amount than that for the senior roles. This can then lead the less senior respondent to perceive that governance structures are swayed toward looking after the shareholders' interests rather than their own and other stakeholders as they are under the impression that they may not be getting paid what they deserve. This is evidenced from the research data where the less experienced project team members scored an average answer of 2.45 for the porrect governance orientation question regarding whether the remuneration is set up to benefit the shareholders or the stakeholders. More experienced

project members scored an average of 3.022, which slightly sways towards a more stakeholder oriented set up if the remuneration system.

The effect of the duration of the project on the respondents mean answers for the project governance orientation construct was then found to not be significant through the ANOVA post hoc analysis.

Lastly, and in relation the demographic variable for which the respondents indicated the industry of the client at the which the ERP project was conducted, the ANOVA test found a common them in that the industry group named “Government / Mining / Energy Production” had significant differences in responses to those individuals whom selected the financial services, other (made up of Agriculture, Other, Security, Services, and Tourism), and the manufacturing industry options. The differences were significant at the 0.05 level, but not at the 0.01 level.

Respondents belonging to the “Government / Mining / Energy Production” demographic scored a significantly higher score than those belonging to the financial services and other demographic, indicating that the government, mining and energy production industries have a governance structure that is more in favour of the stakeholder than the shareholder. This makes sense as this sector has a far-reaching affect in terms of the number of ordinary citizens within South Africa that are affected by their operations, and the high level of accountability that organisations within this sector have to the people that they directly or indirectly affect.

6.4.2 Governance control – behaviour versus outcome

The project governance control construct questions, adopted form Müller and Lecoeuvre (2014), were designed to assess from the respondents the degree to which they have perceived that the control structures employed by their organisations and on projects are either more heavily behaviour and process controlled versus control structures that are more outcomes based. The questions were adapted from their study by making them more ERP project specific for this research rather than for any general organisational project.

As was done for the project governance orientation construct questions, the answers received from the survey respondents for the project governance orientation construct questions were converted into numeric values along a 5-point Likert-scale, an answer closer to the value of 1 indicates an approach to governance whereby there exists tight set controls and strict formal procedures to be followed, whereas a value closer to 5 indicates an approach to governance

whereby only the achievement of successful project outcomes is the focus and project teams are left to draw on their project experience and own devices in order to get the work done.

A Pearson's correlation coefficient test on the construct revealed that the correlations amongst each of the project governance control questions (appendix 5) can be considered strong and significant, giving credibility to the relevance of the questions and the construct as a whole.

The mean score of the governance control construct, measured at 3.08 with a standard deviation of 0.78, showed that the average respondent was on the fence in terms of inferring that the management philosophy of the organisation, and on ERP projects, was that of strict behaviour controls-based approach or more of an outcomes-based approach (Müller & Lecoeuvre, 2014). By analysing the rankings of the sample means of the five project governance control questions, it must be noted that the two questions with the highest means (indicating the favouring of outcomes over behaviour control) was where the respondents indicated that there was a prioritisation of project team member's own experiences in performing their project work compared with the strict adherence to project processes, with a mean of 3.5, and the question where they indicated that the project management philosophy was to let the requirements of the project situation and the project team member's experience personality determine their actions and activities, rather than getting personnel to strictly obey formal job descriptions, with a mean of 3.4.

These findings support the research of Petit (2012) whom inferred that in modern times that bring with them the dynamic and ever-changing environments experienced by corporations and organisations, project managers and teams need to be are of internal and external pressures influencing their project tasks and deliverables, and have the capability of switching between different project management structures or abandon previously laid down procedures, based on the situation at hand in order to get the project tasks completed.

On the other end of the scale, the project governance control questions which ranked as having the two lowest mean scores (favouring behaviour control over outcomes) of the five questions was, firstly, the indication by respondents, with a mean of 2.55, that a structure of rigid and prescribed procedures for most operations by means of sophisticated controls and information systems was favoured by the project management philosophy over loose and informal controls with substantial reliance on informal relationships and cooperation for getting project activities completed (PMI, 2016).

Secondly, with a mean score of 2.9 for the question, respondents were slightly inclined to the notion that their project management philosophy emphasises that project team members must

follow the formal project procedures over the philosophy of just getting the work done even at the expense of bypassing formal policy and procedures (Serrador & Pinto, 2015).

The findings for these two questions that are swayed towards the behaviour and process-controlled side of the construct do concur with the work and research of the PMI (2013), and Serrador and Pinto (2015) whom all insist that project management has to be extremely process driven and tightly controlled with the help of sophisticated information system in order to increase the likelihood of project success, and that the increase in new forms of process and procedure focused forms of project management models and methodologies is evidence that the industry places a high importance in this approach to project governance and recognise its benefits.

The overall statistical results in this research for this construct are complimentary to the conclusions around project governance orientation found in the study by Joslin and Müller (2016) and Müller and Lecoeuvre (2014), whom also uncovered that the respondents to their surveys were also on the fence in terms of whether the project management philosophy experienced was one that favoured strict behaviour and process controls approach or the focused achievement of project outcomes approach. This was evidenced by a mean score in their study for this construct of 2.98.

Further statistical analysis was performed on the construct in terms of multiple one-way ANOVA tests to determine if responses differed for the questions within the project governance control construct depending on the demographics. Initial testing indicated that the chosen demographic variables of ERP project experience, project position, project duration, and client sector all had no significant influence on the project governance control construct answers given by the respondents to the survey.

In summary regarding all ANOVA tests conducted to determine if any demographic groups may have an undue influence on the perceptions of respondents, although a few significant differences were found for the ERP project success and governance orientation variables, these are not considered influential from an overall perspective, and therefore, as per Van de Ven (2007), the data has inferred that there is no existence of significant spurious variables that may affect the cause and effect relationship of governance and ERP project success. This therefore fulfils the third of the casualty criteria so that the discussion in this dissertation can continue regarding governance methods being the cause of ERP project success.

6.5 Research hypotheses

The main purpose of this research was to understand the nature of the relationship between two contrasting styles of project governance and ERP project success.

The two different styles of project governance are, firstly, an approach that is more oriented to the shareholder or towards the stakeholder, entailing that general governance and project governance methodologies focused on the objectives of all relevant stakeholders, or more swayed toward looking out for the interests of only the shareholders and owners of the organisation. Secondly, there is what is known as the behaviour versus outcomes-based approach to general governance and project governance, where the governance method is structured to be strictly controlling over processes and behaviours, or it can be more trusting in the experience and abilities of the project teams in achieving the desired project outcomes as best they see fit (Müller & Lecoeuvre, 2014).

Through the study of most relevant academic literature, on the two main constructs of project governance and ERP project success, as outlined in chapter two of this research, it was hypothesised that the project governance methods adopted on ERP projects is associated with that project's success (Biesenthal & Wilden, 2014; John & Makhija, 2009; Joslin & Müller, 2016; Turner, 2016; Wang & Chen, 2006).

However, the academic literature was limited in terms of what the ideal project governance method was in order to ensure project success. Yet, as outlined in the next two sections below there was enough academic argument found by the researcher to form two specific hypothesis that attempt to uncover the ideal method.

Thus, the two independent constructs of project governance orientation (shareholder versus stakeholder) and project governance control (process / behaviour versus project outcomes) were tested on their correlation with ERP project success using simple linear regression modelling.

6.5.1 Hypothesis one - governance orientation and project success

Project governance orientation entails that governance methods are either swayed towards looking after the needs and interests of the shareholder or owner of an organisation or project, or more towards taking into account the interests of all the relevant stakeholders equally. The most pertinent academic literature on the topic revealed that a stakeholder-oriented approach to corporate governance and project governance should have a positive influence on the

success of the company and of their projects (Eskerod & Huemann, 2013; Eskerod & Vaagaasar, 2014; Joslin & Müller, 2016; Müller & Turner, 2007).

It was therefore hypothesised that project governance process that favours a stakeholder approach is positively correlated with successful project outcomes.

This hypothesis was tested through a simple linear regression model by regressing the project success construct into sub-scaled dependent variable using descriptive analytical techniques as outlined in section 5.5, and the regressing project governance orientation construct as the independent variable using the same techniques as outlined in section 5.6.

The null and alternate hypothesis for the regression model were structured as follows:

Null Hypothesis: $\mathbf{H_0}$: There is no statistically significant positive relationship between the stakeholder form of project governance and project success.

Alternate Hypothesis: $\mathbf{H_1}$: There is a statistically significant positive relationship between the stakeholder form of project governance and project success.

Linear regression modelling revealed that project governance orientation is significantly correlated with ERP project success, and that 13.8% of the variance in ERP project success can be described by the location of governance along the shareholder versus stakeholder scale.

With a standardised correlation coefficient beta of 0.372, at the significant level where the *p*-value is less than 0.001, an increase in a stakeholder orientated form of project governance corresponds with a correlated increase in ERP project success.

The null hypothesis is therefore rejected at the 1% level of significance in favour of the alternate hypothesis stating that there is a statistically significant positive correlation between the stakeholder form of project governance and ERP project success.

These findings support the research of Joslin and Müller (2016) who proved that entities adopting a form of corporate governance and project governance allows them to have the increased chances of achieving ERP project success as they are able to apply the appropriate governance methodology structures and parts to their ERP projects.

These results also support the findings made within the research field for ERP projects specifically, where Wang and Chen (2006) quantitatively proved that project governance plays

a crucial role in negotiating or mediating between the risks, hazards and obstructions experiences on a project and the successful outcomes of the ERP project. This was proven through the analysis of 122 different ERP implementation projects and ended up concluding that project governance directly influences ERP project success.

Finally, and within the South African project management environment, the results of testing this hypothesis gives quantitative confirmation to the qualitative research conducted by South Africans Bekker and Steyn (2008) who found through their interviews of key decision makers on large scale projects that these interviewees already presumed that, based on their wealth of experience in project management, that by applying or not applying certain project governance methodologies, culture and principles would certainly have an influence on whether there projects would be successful or not

6.5.2 Hypothesis two - governance control and project success

The notion of project governance control depicts that the project management philosophy of governance is that the control structures employed by their organisations and on projects are either heavily swayed towards having strict and clearly defined controls in place, often aided by the use of sophisticated information systems, and that formally laid down processes and procedures are followed by all project team members and most project stakeholders, or that the governance structure favours an approach whereby the only focus is the achievement of specific project outcomes via a dependence on the experience of individual team members and the informal relationships amongst them, and achieving these outcomes by reacting to the situation at hand rather than complying with strict methodology (Müller & Lecoeuvre, 2014).

Research and academic literature into controls, processes and procedures as a form of project governance revealed that the behaviour and process-controlled approach seems to be favoured and should increase an entities chance of achieving project success (Joslin & Müller, 2016; Müller & Lecoeuvre, 2014; Petit, 2012; PMI, 2013; Serrador & Pinto, 2015).

It was therefore hypothesised by the researcher that a project governance approach that favours behavioural and strict process control will have a positive correlation with successful project outcomes.

This hypothesis was tested through a simple linear regression model by regressing the project success construct into sub-scaled dependent variable using descriptive analytical techniques

as outlined in section 5.5, and the regressing project governance control construct as the independent variable using the same techniques as outlined in section 5.6.

The null and alternate hypothesis for the regression model were structured as follows:

Null Hypothesis: **H_0**: There is no statistically significant positive correlation between the process / behaviour-controlled form of project governance and project success.

Alternate Hypothesis: **H_1**: There is a statistically significant positive correlation between the process / behaviour-controlled form of project governance and project success.

Linear regression modelling revealed that project governance control is not significantly correlated with ERP project success. Similarly, the Pearson's correlation coefficient (or the standardised coefficient of behaviour vs outcome control) of 0.058 indicates that project governance has no correlation to ERP project success. The adjusted R-square value in the results describes that project governance control explains almost none of the variance in ERP project success (the dependent variable).

Surprisingly, despite the academic literature on formal controls and processes a successful project governance method, the linear regression model has indicated that the sample evidence is not strong enough to reject the null hypothesis in favour of the alternate hypothesis at the 5% level of significance. Therefore, the null hypothesis is probably true in that there is no statistically significant positive correlation between the process / behaviour-controlled form of project governance and ERP project success.

Although these findings match the results of the study conducted by Joslin and Müller (2016), It is still somewhat surprising that the second independent variable of project governance control does not have an association with ERP project success as insisted by scrutinising the academic literature on the topic. However, the results here may give further credibility to the notion as outlined in the textbook by Müller, Shao and Pemsel (2016), whom expanded on the research by Turner and Müller (2004), where it is described that when structuring an entities approach to the controls aspect of their project governance methodology, a balance must be found between being entirely too focused on strict controls or the constant regulation of project staff's behaviour, and the control methodology of being too trusting with loose and informal controls, as a project governance methodology that is too swayed in either direction will both lead to failing projects.

The results of this study and that of Joslin and Müller (2016) therefore infer that a governance structure that sits more towards the controlling end of the control versus outcomes governance continuum will not automatically increase the organisations chances of achieving ERP project success compared with if that organisation employed a more outcomes-based governance methodology.

Due to much of the academic literature insisting on a tight and sophisticated controls-based approach to project governance, the findings of this research then challenge some renowned governance features of popular project governance methodology frameworks such as the Capability Maturity Model Integration (CMMI) (Khan & Keung, 2016), and the Organisational Project Management Maturity Model as created by the Project Management Institute (PMI, 2013). Both these frameworks insist that a tighter and sophisticated set of controls and a strictly adhered to checklist of procedures will increase the entities' chances of project success.

In accordance with placing the CMMI and the Organisational Project Management Maturity Model under scrutiny, Yazici (2009), and successfully expanded upon by Berssaneti and Carvalho (2015), inferred that for these models to be effective in increasing the chances of achieving project success on a consistent and repetitive basis, then a specific type of organisational culture has to first be instilled by the organisations. Both groups of researchers were able to demonstrate that rather than a focus on the controls aspect of governance, it is the existence of a clan culture mentality, which entails that there is a prioritisation of all stakeholders participating, a unity amongst project team members, a shared values approach to the project goals, and a determined commitment to achieving organisational objectives that should be the cornerstone of any project management methodology model and is the governance orientation that is most correlated with the achievement of successful project outcomes.

This Notion by Yazici (2009) is has its roots in one of the theoretical lenses of this study, that of stewardship theory. Stewardship theory suggest that the actions of people within an organisation are in line with and supporting of the group and organisational objectives rather than the person al objectives of that individual in a selfish fashion.

In closing, and to provide for the further support of the notion that an equilibrium approach to the selection of where on the project governance control continuum the organisation should sit, Turner and Müller (2004) found that project managers, acting as agents for the shareholders and project sponsors, are responsible for overseeing the execution of a number of very complex tasks, as is the norm with the implementation of sophisticated ERP systems,

and are simply expected to complete these tasks with minimal fuss, therefore a certain amount of trust and flexibility should by allowed by shareholders or project sponsors (acting as the principal).

6.6 Project governance and the project success dimensions

In addition to the results of the hypothesis testing revealing that only the construct of project governance orientation was positively correlated with ERP project success, a correlation analysis was conducted between each of the new ERP project success dimensions and the project governance orientation construct. The graphical results of this analysis are shown in figure 18 towards the end of chapter 5.

Figure 18 shows that the success dimension “project benefits & stakeholder satisfaction”, which contains the most number of project success questions compared with the other dimensions, and contains within some of the more crucial project success factors such as organisational improvement, the achievement of project goals, user and stakeholder satisfaction, and project impact, is the project success factor that is most strongly correlated with the chosen orientation (shareholder versus stakeholder) of project governance.

This is supported by the academic literature in that researchers point at that an organisational culture that is more oriented towards a stakeholder approach will take active steps to balance the needs, requirements, and interests of many different stakeholder groups concurrently, instead of only the interests of the shareholders, owners or project sponsors of the organisations (Müller & Lecoeuvre, 2014). Furthermore, the dimension of “project benefits & stakeholder satisfaction” being the most correlated is in conjunction with the findings of Tantalo and Priem (2016) who show that organisations that employ an uncompromising stakeholder-oriented approach within their governance structure will, in mist circumstances, be comparatively successful to other non-stakeholder orientated organisations in terms of profits earned, organisational performance, financial growth, and stability.

This notion also applies equally to all the other project success dimensions as split up through the factor analysis conducted in this research. All the other, not yet mentioned, dimensions that contain a factor used to measure project success, namely future potential, project costs, deadlines & scope, and project efficiency are all positively correlated with the varying level of the stakeholder orientated approach to governance that is adopted by the organisation, except for project reputation, which is very slightly negatively correlated.

6.7 Discussion summary

This research set out to explore the relationship between project governance and ERP project success and hypothesised that both project governance that is stakeholder oriented and project governance that is process controlled are positively correlated with ERP project success.

The sample size was deemed to be of adequate size, with the demographics of the respondents being applicable to the research objectives, and relevant to the target population of the study.

The means of the three constructs indicated that in general, the sample indicated that ERP projects executed at large south African organisations have been generally quite successful. In measuring the two project governance constructs, the view was that the sample was of the opinion that their projects were governed with more of a stakeholder approach than a shareholder approach, however the sample was more or less indifferent as to whether the project processes were strictly controlled or whether the focus was more solely on the project outcomes.

The statistical testing of the hypothesis through linear regression modelling revealed that There is a statistically significant positive correlation between the stakeholder form of project governance and project success, but also that There is no statistically significant positive correlation between the process / behaviour-controlled form of project governance and project success. Finally, through a correlation analysis, project governance is most associated with the “project benefits and stakeholder satisfaction” dimension of project success.

These research results are fairly consistent with other academic research studies on similar topics (Bekker & Steyn, 2008; Joslin & Müller, 2016; Müller & Lecoeuvre, 2014; Müller & Martinsuo, 2015; ul Musawir et al., 2017; Wang & Chen, 2006).

7 Conclusion

7.1 Introduction

This dissertation has sought to empirically investigate and understand the relationship between ERP project success of large-scale ERP projects at South African organisations and the contrasting methods of project governance that can be applied to these types of projects.

This chapter outlines the specific main and sub-objectives of the research and then proceed with results and findings of the study. It will then move onto what the implications and recommendations of the research are in terms of how it matters from a business and management perspective and a theoretical perspective. The researcher's recommendations for future research and the limitations of the study are also discussed.

7.2 Recap of the research objectives

There was one key objective to this study and a few sub objectives. The one main objective of the research was to test for a correlation between the choice of project governance method utilised and success on ERP projects. This was to allow management and business decision makers to understand some of the factors that they need to consider that have an effect on the methods by which projects are governed with in their organisation, and therefore what effect these methods will have on their chances of achieving ERP project success.

The sub-objectives included:

I. Determine the level of project success achieved by South African organisations on ERP projects.
II. Understand which project governance orientation method is employed by projects teams at South African organisational clients in terms of whether the interests of the shareholder or the interests of all stakeholder are generally favoured.
III. Understand which project governance control method is employed by projects teams at South African organisational clients in terms of whether there are staff behaviour and processes are strictly controlled or whether the focus is on the achievement of project objectives by trusting the project teams and their experience.

7.3 Summary of the research findings

The key objective of the research was to test the relationship of contrasting approaches to project governance in achieving success on ERP projects. A deductive research methodology approach was utilised to test a research model based on theory that has been applied to organisational management principles (Eisenhart, 1985), organisational finance (Fama, 1980), and more importantly for this research, to organisational governance (Adams, Hermalin & Weisbach, 2010) and project governance (Müller & Lecoeuvre, 2014). The two theories that drove the focus in this research was that of agency theory and stewardship theory.

Three main constructs were derived from the literature review of this research. the first construct being ERP project success, which consisted of the five subdimensions, as per Khan et al. (2013), being project efficiency, organisational benefits, project impact, future potential, and stakeholder satisfaction. The second and third constructs were derived from the notion of project governance (Müller & Lecoeuvre, 2014). The project governance orientation construct implies that firms can either favour the interest of shareholders with their orientation of project governance, or favour the interests of all stakeholders. The project governance control construct implies that project governance can either take the form of enforcing the adherence of strict behaviour rules, or having trust in the abilities and experience of the project team members to deliver the required outcomes.

Through the literature review and the discover of the above constructs, it was thus hypothesised that:

- **Hypothesis 1:** A project governance process that favours a stakeholder approach has a positive relationship with successful ERP project outcomes.
- **Hypothesis 2:** A project governance approach that favours behavioural and strict process control will have a positive relationship with successful ERP project outcomes.

These hypotheses were developed in order to test the relationships between the relevant research constructs. But before these relationships could be put to the test, the constructs of project governance and project success were statistically analysed in a stand-alone fashion.

The data used to conduct the statistical analysis was obtained from a sample of 165 individuals with the relevant ERP project experience. The respondents to the survey were made up predominantly of ERP professionals and project managers who both had extensive ERP project experience in South Africa.

The first construct put under statistical scrutiny was that of project success. Although the list of 32 project success questions, as formulated by Khan et al. (2013), had already been formulated and grouped in five distinguishable dimensions of project success, an exploratory factor analysis revealed a new grouping of these dimension, which were renamed by the researcher and are considered to be, for the purposes of this research, the ERP project success dimensions consisting of project benefits & stakeholder satisfaction, future potential, project reputation, project learnings & personal rewards, project efficiency, and project costs, deadlines & scope.

The mean score for the project success construct indicated that that the survey respondents generally felt that their ERP projects achieved success. This is in line with a similar studies conducted by Joslin and Müller (2016) and Serrador and Turner (2015). Project benefits and stakeholder satisfaction dimension scored the highest mean of all the individual project success dimensions. This result indicates that ERP projects executed at large South African organisations have been generally quite successful, even though a study by Fitz-Gerald and Carroll (2003) suggested that around a quarter of all ERP projects failed on key project success factors such as running over budget and not finishing on time.

It was found in the research by analysing the demographic effect on the respondents'' answers that the longer the duration of the ERP project and the longer the ERP experience of the individual, the more likely the respondents were to indicate that the project wasn't as successful as the projects that were completed in less time. This combined with the nation that ERP projects should not take more than a year to execute leads to the conclusion that ERP projects with a long duration will be assessed as

The second construct analysed was that of project governance orientation. The mean score for the construct sits moderately of the midpoint of the 5-point Likert scale which indicates that respondents felt that a governance approach that was more swayed toward the stakeholder's interests over that of the shareholders existed on their last ERP project in question. The question within the project governance orientation construct that most leant towards a stakeholder orientated approach was the response that indicated that the organisations of the individuals requires them to sometimes sacrifice financial objectives in the pursuit of improving stakeholder satisfaction.

Two interesting differences in means scores for specific questions within the project governance orientation construct due to some demographics that respondents identified with were uncovered through ANOVA tests. Firstly, respondents with more ERP project experience indicated that their organisations and projects were governed with a more stakeholder-

oriented approach, and secondly, respondents implementing projects for the “Government / Mining / Energy Production” sector also indicated a favouring of the stakeholder approach over the financial services sector and other industries.

The statistical analysis conducted on the final construct being the behaviour and process controlling approach versus the outcomes-based approach to project governance showed that the average respondent was on the fence when indicating which of the two approaches was most prevalent on their last ERP project.

This outcome was slightly unexpected by the researcher, but does concur with the findings of Petit (2012) and crucially may prove to organisations that implement an ERP system, or those software providing firms that are responsible for implementing ERP systems for their clients, that a balanced approach to project governance should be sought in terms of the sophisticated controls and processes put in place to run a project, and the level of trust that is afforded to project team member in using their experience and know-how to achieve the relevant project outcomes and objectives.

These initial findings regarding the success of projects, an inclination towards a stakeholder-oriented approach to governance, and a neutral stance on the process controls versus outcomes approach to governance are supported by the research findings of Eskerod and Vaagaasar (2014), Joslin and Müller (2016) and Müller and Lecoeuvre (2014)

Regression modelling was performed on each hypothesis in order to prove or disprove them, but also to see if the relationship could be successfully quantified. The results of the first hypothesis test revealed that there is a statistically significant positive correlation between the stakeholder form of project governance and project success, and that 13.8% of the variance in ERP project success can be described by the location of governance orientation along the shareholder versus stakeholder scale.

The results of the second test indicate that the hypothesis stating that here is a statistically significant positive correlation between the process / behaviour-controlled form of project governance and project success, cannot be proven with the gathered research data as the project governance control method does not have a significant relationship with ERP project success.

The conclusion of these results addresses the initial research question by stating that the project governance approach method has a moderate, but significant relationship with ERP project success.

The findings of this research could be used to support existing literature on organisational and project governance to remind organisations to recognise their own methods of governance, where it sits on the stakeholder versus shareholder and controls versus outcomes continuums of project governance, and the possibly helpful effect that a more stakeholder focused approach to project governance can have on the achievement of ERP project success.

The research of Yazici (2009) discovered that the inherent organisational culture has an influence on the success of their projects, and that organisations that adopt a governance approach that is inclusive of most stakeholder's interest, promotes connectedness amongst teams, and shows the committed pursuit of shared values have a greater chance of achieving project success. In addition, a governance structure in organisations that favours a stakeholder and shared-values approach is indicative of the principles of stewardship theory existing as an explanation of the dynamics of the stakeholder relationships with the organisation (Donaldson & Davis, 1991; Joslin & Müller, 2016; Müller & Lecoeuvre, 2014).

However, Pitsis, Sankaran, Gudergan and Clegg (2014) explain that beneficial stewardship type relationships can only exist within an organisation that is experiencing positive financial and operational success, and that most of the employees, top management and directors have the relevant psychological capabilities. Organisations that, over time, find their performance declining due to a poor business climate or increase in competition, may opt to change or enhance their governance methodologies through the implementation of extreme oversight of controls and procedures has proven to lead to staff, management and project team members adopting behaviours that are more associated with the negative aspects of agency theory (Müller et al., 2013; Pitsis et al., 2014).

In conclusion, in order to determine the suitable governance methodologies to apply within an organisation and onto ERP projects, the current business environment that the organisation finds itself in, and therefore the governance structure it has adopted to adapt to this environment must be assessed, and the consequences that result in terms of the relationship types that resemble the characterises of either an agency or stewardship perception must be taken into account, as well as the implications mentioned in the following section.

7.4 Recommendations and implications

The findings contained within this study supported one of the two research hypotheses, but have also given insight into how any of the three constructs, consisting of project governance orientation, project governance control, and ERP project success, can have an effect on organisations, project team members, and ERP projects.

7.4.1 Practical implications for business and management

Specific project stakeholders, such as project managers, project sponsors, project steering committees, and the heads of departments in which the project is being executed, should be made aware, when designing their project management and governance models, of the significant role that a more stakeholder orientated approach to governance can play in helping to achieve ERP project success. This concept could be in certain educational of training programs at academic institutions and within business, and tailored to project architects, project managers, and business decision makers. This notion should be included in any educational programs that include topics surrounding governance, project governance, management training, organisational design, and the like.

Within all of the above, the managers and decision makers on projects should be educated on the implications that strictly designed control and process structures, or a complete lack of structure with a complete reliance and trust in the experience of the project team members, that leans excessively on either end of the project governance control continuum can have on the chances of the ERP project being successful, as either of these two governance approaches implemented in isolation do not have a correlation with ERP project success.

The findings of this research should also be of interest to human resource department managers and recruiters as they should ensure that current and potential project managers and project team members have the relevant personality traits in line with that of preforming a stewardship type of role that suits the methods pf project governance orientation that favours the stakeholder approach.

Finally, ERP project managers should make themselves aware of their own organisation's governance frameworks and method, and that of the client's, and collaborate with that organisations governance authorities in order to refine or adopt these methods to the required governance approach on the project to be executed.

7.4.2 Theoretical implications

This study leveraged off the project success construct questions as presented by Khan et al., (2013), and as grouped into the separate project success dimensions by Joslin and Müller (2016). However, as these questions were adapted by the researcher to be specific to ERP projects, and not projects in general, an exploratory factor analysis on all project success questions revealed a different grouping structure for the questions, suggesting that there are different dimensions for ERP project success.

Stewardship theory, as operationalised by Müller and Lecoeuvre (2014) to explain the side of project governance orientation that is swayed towards the interest of all stakeholders and the side of project governance control that is more swayed toward that of a focus on projects outcomes, can be seen as a suitable theoretical lens for deciphering the intricacies of project governance. Stewardship theory, in conjunction with stakeholder theory, could therefore be put forward as suggested theories to be used for the creation and practice of project governance methodologies and principles.

At the same time, there are aspects if this study that show a few of the limits of the agency theory methods of project governance. This theory was also operationalised in this research to explain the side of project governance orientation that is swayed towards the interest just the owners or shareholders and the side of project governance control that is more swayed a strict focus on tight controls and processes. The results of this research show that an approach to governance that resembles the extremes of agency theory dynamic is not likely to have a positive impact on project results.

A pertinent theoretical implication discovered through this research is that for academics to attempt to build a more comprehensive theory for project governance, it should be considered that either a shareholder or stakeholder focused approach to project governance requires that it is employed in such a manner that allows it to thrive. Yet it may be implemented within an overarching corporate governance setting that may not support that approach which can create a conflict or points of resistance. Further academic research then may be required to clarify all the interaction points between organisational governance and project governance, as this can then be used as a method to sync up the two different forms of governance that exist at separate hierarchal levels within an organisation.

7.4.3 Suggestions for future Research

In addition to any suggestions made in section 7.4.2 above, further research around the topic of project governance and ERP project success should be done that focuses on the specific substance of the association between the different project success sub-dimensions and ERP project success. Although all the original (prior to the factor analysis of project success conducted as part of this research) different sub-groups of project success (project efficiency, organisational benefits, project impact, future potential, and stakeholder satisfaction) can be seen as being important, an argument can be made that some are more important than others. Therefore, studies could be done to ascertain what project governance methods leads to the greatest chance of ERP project success for specific project success factors.

Further research could be applied to the confirmation of the applicability and appropriateness of the newly formed dimensions of ERP project success as discovered through the exploratory factor analysis on the original project success factors found in reviewing academic literature for this study.

Based on the relevant literature, this study made the assumption that the governance culture and principles inherent in an organisation is what predominantly determines the project governance orientation to be utilised. New research, both quantitative and qualitative, is required to ascertain if a specific governance structure or culture that is most suited to achieving the successful outcomes of ERP projects can be different to, exist independently of the governance structures adopted and inherent in the organisation as a whole.

Finally, future academics could attempt to explore the influence the different governance methods that have been discovered by past studies has on project success rates at the project portfolio level. This study focus on project governance, that is the method by which individual projects are governed, but by grouping all ERP projects embarked on by an organisation and determining how they are governed, known as the governance of projects (Müller, Zhai, Wang & Shao, 2016), it can be investigated if the two governance methods are different and which types of governance orientation are most associated with ERP project success and ERP project portfolio success.

7.5 Limitation of the study

One of the main research limitations of this study was the utilising of only one particular model that attempts to describe the four possible dynamics of organisational governance and project governance. In further research, other forms of governance frameworks or models can be utilised in similar studies that attempt to link governance with project success and hopefully show a more complete view of this relationship.

As described in chapter 4 of this study, there are some pertinent limitations to this study due to the methodology that needed to be followed to conduct the research. The purposive and non-probability sampling method which runs the risk that the survey respondents do not complete represent the target population. The cross-sectional nature of the study only allows a time-specific viewpoint of the respondent's perceptions to project governance and success.

This study makes mention of, and utilises the cause and effect conditions as made famous by the 1800's philosopher John Stuart Mills and often referred to today as Mill's method or theory of causality, and utilised in the book by Van de Ven (2007). The cause and effect testing

conditions, being time sequence, covariance, non-spurious associations and theoretical support, were used in part to infer that through the study of governance and project success academic literature, it can be shown that organisational governance precedes and determines project governance, and that project governance has an effect on project success.

The cross-sectional nature of this study allowed the researcher to test the second and fourth conditions listed above. Covariance was shown in the testing of the constructs through regression modelling that project governance orientation is significantly correlated with project success. The theoretical support condition was outlined in chapter 2 of this study to show that the academic literature used to form the study's hypotheses repeatedly assumed, and sometimes tested for, the causal association of governance structures with that of organisational or project success (Joslin & Müller, 2016; Van de Ven, 2007).

However, causality between organisational governance and project success cannot be claimed in its entirety in this research as the cross-sectional limitations and specific focus of the research did not allow for the time-sequence and non-spurious association conditions to be adequately tested.

Therefore, the conclusions reached in this research of an association between project governance and project success can provide a base for future studies that attempt to prove causality within the framework of organisational governance, project governance and project success, and crucially, the direction of this relationship to make proven inference on the specific part that governance has to be as an important success factor for projects and ERP projects.

7.6 Conclusion

The nature of governance and project success prided some fascinating insights through a review of academic literature and is relevant to project and business decision maker in attempting to understand the optimal governance structures to implement.

This study showed the linkages between the constructs of a shareholder or a stakeholder governance approach, a strictly process controlled or outcomes-based governance approach, and that of ERP project success. Only one of the research hypotheses were proven valid in that there is a significant correlation between project governance orientation and ERP project success, yet no significant correlation between project governance control and ERP project success.

This research contributes to the body of knowledge around project governance and project success in that it adds to the explanation of which of four specific approaches to project success can increase the probabilities of achieving project success, but specifically, ERP project success. The hope is that a sufficient grounding has been supplied in that new avenues can now be opened for researchers to explore the theory of causality and the true link between organisational governance and project governance, and rank the importance of the role that governance has to play as a success factor for projects and ERP projects.

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9 Appendices

9.1 Appendix 1 - Online survey

Introduction

I am conducting research for my MBA dissertation at the Gordon Institute of Business Science. For the thesis I will be analysing the relationship between project governance and project success on ERP implementation and related projects. You have been selected for this survey as you have been involved, in some capacity, in a recent ERP implementation or related, large-scale project.

The survey should take no more than 10 minutes of your time. Your participation is voluntary, and you can withdraw at any time without penalty. Your participation is anonymous and only aggregated data will be reported. By completing the survey, you indicate that you voluntarily participate in this research. Your participation is much appreciated. The research paper will be submitted in March 2019, and if you would like a copy of the report then I will gladly send it to you.

If you have any concerns, please contact my supervisor or me. Feel free to contact me on my cell if you have any questions whilst completing the questionnaire. Our details are provided below:

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The questionnaire below is almost replica of the measurement instrument utilised by Joslin & Müller (2016). The questionnaire for the final research paper below has been slightly amended so that it is more customised towards ERP implementation projects, rather than just general company projects.

All of the following questions relate to your experience and involvement with regards to the latest and completed ERP implementation, and not your general experience on all previous ERP projects combined. If you have not specifically been involved on an ERP implementation project, then your experience on your latest large-scale ERP addition project (such as an SAP Warehouse Management implementation, an Oracle CRM implementation, etc.) will suffice.

Within this survey, a client refers to the organisation at which the ERP or related project is being executed for and is usually responsible for the associated costs. The ERP provider is usually that firm that is contracted by the client to perform the majority of the ERP project work. An ERP Professional refers to an ERP certified consultant that is either directly employed by the ERP provider or client.

Section 1

1. Please provide your initials in the text box below (this is only to check for possible duplicate survey responses):

2. Please select the Sector / Industry of the Company at which the ERP Project was executed. (A-Manufacturing; B-Information & Communications Technology; C-Mining or Energy Production; D-Financial Services; E-Agriculture; F-Construction or Engineering; G-Government or Municipal Services; H-Wholesale or Retail Trade; I-Tourism; J-Other)

3. Please select the main position you held or the role you predominantly played during the ERP project. (A-CIO or CTO; B-Head of ERP / IT Department; C-Project Manager; D-ERP Professional / Consultant; E-Project Team Member (permanent employee at client); F-System End-User & Project Team Member (permanent employee at client); G-Solution Architect / Advisor; H-Client; I-Other)

4. Gender. (A-Male; B-Female; C-Prefer not to say)

5. City in which you performed the majority of the project work in question: _____

6. ERP Project Experience (in years). (A-Less than 1 year; B-1 to 2 years; C-2 to 5 years; D-5 to 10 years; E-10 to 20 years; F-over 20 years)

7. Work Experience (in years). (A-Less than 1 year; B-1 to 2 years; C-2 to 5 years; D-5 to 10 years; E-10 to 20 years; F-Over 20 years)

Section 2

For the following questions, please provide specific details regarding the last ERP project in question:

8. Duration of the Project. (A-Under 6 months; B-6 months to less than 1 year; C-1 to 2 years; D-Over 2 years)

9. Level of Project Complexity - a high level of project complexity entails that the following have been identified as significant criteria or project attributes – Life-cycle size for cost, Life-cycle duration for schedule, Project organisation complexity, Technological readiness, Risk, Visibility, and Authorisation basis. (A-Low; B-Medium; C-High).

10. Value of Last Project. (A-Under R1 million; B-R1 million to R3 million; C-R3million to R5 million; D-R5 million to R8 million; E-R8 million to R12 million; F-over R12 million).

11. Urgency of Last Project. . (A-Low; B-Medium; C-High).

12. Organisational structure of the client at which the project was executed. (A-Projectized Organisation (organizations arrange their activities into programs or portfolios and implement them through projects); B-Functional Organisation / Department (a hierarchical organization structure wherein people are grouped as per their area of specialization); C-Matrix Organisation (combination of projectized and functional organisations); D-Other).

Section 3

For the following statements, please utilise the 5-point Likert scale to indicate, with regards to the last ERP project you were involved with, whether or not the project was successful in terms of achieving the following objectives:

(1 = Not Successful; 2 = Slightly Successful; 3 = Moderately Successful; 4 = Highly Successful; 5 = Very Highly Successful).

13. The project was completed according to the specifications.

14. The ERP service providing company (the firm contracted to execute the project in conjunction with the client) was satisfied with the project outcomes.

15. The project was enabling of other related project work in future.

16. The project was perceived as being highly successful by the client's competitors and other businesses (including other ERP project and support firms).

17. The project yielded business and other benefits.

18. The project met the client's requirements.

19. The project caused minimum disruption to the organization

20. The costs and budget for the project were judged as being used effectively.

21. The project met the planned quality standards.

22. The project adhered to the defined procedures of the client.

23. The project provided valuable learnings to most stakeholders.

24. There was a smooth handover of the project outputs.

25. The project resources were mobilised and used as planned.

26. The project outcome crated an improvement in organisational capability.

27. The project required a minimum number of agreed scope changes.

28. The project could be used as motivation for future projects.

29. The project's impact on its beneficiaries are visible.

30. The project achieved its purpose.

31. The project has good reputation amongst the other business units, competitors and ERP project providing firms.

32. The project finished on time.

33. New understanding and knowledge was gained from the project.

34. The project's steering group was satisfied.

35. The End-User group was satisfied.

36. The project team was satisfied.

37. The project activities were carried out as scheduled.

38. The project finished within budget.

39. The project sponsor/s was satisfied.

40. The end product, as a result of the project, was used as planned.

41. There were personal financial rewards as a result of the project.

42. The project met the organisational objectives.

43. The project satisfies the needs of the users.

44. There were personal non-financial rewards as a result of the project.

Section 4

In relation to the past ERP project that you were involved in, please select an answer on the following 7-point scale in order to determine the level at which you believe your organisation, and project team, adopts the principles contained in either statement A or B, as shown below:

(1 = Strongly Favour A; 2 = Moderately Favour A; 3 = Slightly Favour A; 4 = Indifferent between A & B; 5 = Slightly Favour B; 6 = Moderately Favour B; 7 = Strongly Favour B).

45. In my organisation and on ERP projects:

A) …decisions are made in the best interest of the shareholders and owners of the organization and their return on investment (ROI);

B) or …decisions are made in the best interest of the wider stakeholder community (including shareholder, employees, suppliers, local communities etc.).

46. In my organisation and on ERP projects:

A) …the remuneration system includes stock-options for employees and similar incentives that foster shareholder ROI thinking;

B) or …the remuneration system provides incentives for community, environmental, humanitarian or other non-profit activities outside and/or inside the organization.

47. In my organisation and on ERP projects:

A) …prevails an image that profitability determines the legitimacy of actions (including projects);

B) or …prevails an image that wider social and ethical interests determine the legitimacy of actions (including projects).

48. In my organisation and on ERP projects:

A) …I am sometimes asked to sacrifice stakeholder satisfaction for the achievement of financial objectives;

B) or …I am sometimes asked to sacrifice the achievement of financial objectives for improvement of stakeholder satisfaction.

49. In my organisation and on ERP projects:

A) …the long-term objective is to maximise value for the owners of the organization;

B) or …the long-term objective is to maximise value for society.

50. The management philosophy in my organization and on ERP projects favours:

A) …a strong emphasis on always getting personnel to follow the formally laid down procedures;

B) or …a strong emphasis on getting things done even if it means disregarding formal procedures.

51. In my organisation and on ERP projects, there exists:

A) …tight formal control of most operations by means of sophisticated control and information systems;

B) or …loose, informal control; heavy dependence on informal relationships and the norm of cooperation for getting things done.

52. In my organisation and on ERP projects:

A) …a strong emphasis is placed on getting personnel to adhere closely to formal job descriptions;

B) or …there is a strong emphasis to let the requirements of the situation and the individual's personality define proper on-job behaviour.

53. In my organisation and on ERP projects:

A) …support institutions (like a Project Management Office or Team) should ensure compliance with the organization's project management methodology;

B) or …support institutions (like a Project Management Office or Team) should collect performance data in order to identify skills and knowledge gaps.

54. In my organisation and on ERP projects, there is a:

A) …prioritisation of methodology compliance over people's own experiences in doing their work;

B) or …prioritization of people's own experiences in doing their work over methodology compliance.

9.2 Appendix 2 – Project success factors

The project success factors scale as per Khan, Turner and Maqsood (2013).

1. **Project Efficiency**

- Finished on time
- Finished within budget
- Minimum number of agreed scope changes
- Activities carried out as scheduled
- Met planned quality standards
- Compiled with environmental regulations
- Met safety standards
- Cost effectiveness of work
- Resources mobilised and used as planned

2. **Organisational Benefits**

- Learned from project
- Adhered to defined procedures
- End product was used as planned
- The project satisfies the needs of users
- New understanding / knowledge was gained

3. **Project Impact**

- Project's impact on beneficiaries is visible
- Project achieved its purpose
- End-user satisfaction
- Project has a good reputation

4. Future Potential

- Enabling of other project work in future
- Motivation for future projects
- Improvement in organisational capability

5. Stakeholder Satisfaction

- Sponsor satisfaction
- Steering group satisfaction
- Met client's requirements
- Met organisational objectives

9.3 Appendix 3 - Project success questions

Key:

PE = Project Efficiency SS = Stakeholder Satisfaction FP = Future Potential

OB = Organisational Benefits PI = Project Impact

Question Number	Question
PS_PE_13	The project was completed according to the specifications.
PS_SS_14	The ERP service providing company (the firm contracted to execute the project in conjunction with the client) was satisfied with the project outcomes.
PS_FP_15	The project was enabling of other related project work in future.
PS_PI_16	The project was perceived as being highly successful by the client's competitors and other businesses (including other ERP project and support firms).
PS_OB_17	The project yielded business and other benefits.
PS_SS_18	The project met the client's requirements.
PS_PE_19	The project caused minimum disruption to the organization
PS_PE_20	The costs and budget for the project were judged as being used effectively.
PS_PE_21	The project met the planned quality standards.
PS_OB_22	The project adhered to the defined procedures of the client.
PS_OB_23	The project provided valuable learnings to most stakeholders.
PS_PE_24	There was a smooth handover of the project outputs.
PS_PE_25	The project resources were mobilised and used as planned.
PS_FP_26	The project outcome crated an improvement in organisational capability.
PS_PE_27	The project required a minimum number of agreed scope changes.
PS_FP_28	The project could be used as motivation for future projects.
PS_PI_29	The project's impact on its beneficiaries are visible.
PS_PI_30	The project achieved its purpose.
PS_PI_31	The project has good reputation amongst the other business units, competitors and ERP project providing firms.
PS_PE_32	The project finished on time.
PS_OB_33	New understanding and knowledge was gained from the project.
PS_SS_34	The project's steering group was satisfied.
PS_PI_35	The End-User group was satisfied.
PS_SS_36	The project team was satisfied.
PS_PE_37	The project activities were carried out as scheduled.
PS_PE_38	The project finished within budget.
PS_SS_39	The project sponsor/s was satisfied.
PS_OB_40	The end product, as a result of the project, was used as planned.
PS_SS_41	There were personal financial rewards as a result of the project.

PS_SS_42	The project met the organisational objectives.
PS_OB_43	The project satisfies the needs of the users.
PS_SS_44	There were personal non-financial rewards as a result of the project.

9.4 Appendix 4 - Governance questions: shareholder vs stakeholder

Shareholder versus Stakeholder Governance Questions

Question Number	Question	
	Statement A	Statement B
PG_SH_45	Decisions are made in the best interest of the shareholders and owners of the organization and their return on investment (ROI)	Decisions are made in the best interest of the wider stakeholder community (including shareholder, employees, suppliers, local communities etc.).
PG_SH_46	The remuneration system includes stock-options for employees and similar incentives that foster shareholder ROI thinking	The remuneration system provides incentives for community, environmental, humanitarian or other non-profit activities outside and/or inside the organization
PG_SH_47	There prevails an image that profitability determines the legitimacy of actions (including projects)	There prevails an image that wider social and ethical interests determine the legitimacy of actions (including projects)
PG_SH_48	I am sometimes asked to sacrifice stakeholder satisfaction for the achievement of financial objectives	I am sometimes asked to sacrifice the achievement of financial objectives for improvement of stakeholder satisfaction
PG_SH_49	The long-term objective is to maximise value for the owners of the organization	The long-term objective is to maximise value for society

9.5 Appendix 5 - Governance questions: behaviour vs outcome control

Behaviour versus Outcome Governance Questions

Question Number	Question	
	Statement A	Statement B
PG_BC_50	There is a strong emphasis on always getting personnel to follow the formally laid down procedures	There is a strong emphasis on getting things done even if it means disregarding formal procedures
PG_BC_51	There are tight formal controls of most operations by means of sophisticated control and information systems	There is loose, informal control; heavy dependence on informal relationships and the norm of cooperation for getting things done
PG_BC_52	A strong emphasis is placed on getting personnel to adhere closely to formal job descriptions	There is a strong emphasis to let the requirements of the situation and the individual's personality define proper on-job behaviour
PG_BC_53	Support institutions (like a Project Management Office or Team) should ensure compliance with the organization's project management methodology	Support institutions (like a Project Management Office or Team) should collect performance data in order to identify skills and knowledge gaps
PG_BC_54	There is a prioritisation of methodology compliance over people's own experiences in doing their work	There is a prioritisation of people's own experiences in doing their work over methodology compliance

9.6 Appendix 6 – Post hoc ANOVA results for project success

Project duration:

Multiple Comparisons

Scheffe

Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Project_ben_stake Project benefits and stakeholder satisfaction	Under 1 year	1 to 2 years	-0,00256	0,08543	1,000	-0,2136	0,2085
		Over 2 years	0,31981	0,13349	0,060	-0,0099	0,6496
	1 to 2 years	Under 1 year	0,00256	0,08543	1,000	-0,2085	0,2136
		Over 2 years	.32238*	0,12535	0,039	0,0127	0,6320
	Over 2 years	Under 1 year	-0,31981	0,13349	0,060	-0,6496	0,0099
		1 to 2 years	-.32238*	0,12535	0,039	-0,6320	-0,0127
Future Future potential	Under 1 year	1 to 2 years	-.44644*	0,10812	0,000	-0,7135	-0,1794
		Over 2 years	-0,26415	0,16894	0,297	-0,6814	0,1531
	1 to 2 years	Under 1 year	.44644*	0,10812	0,000	0,1794	0,7135
		Over 2 years	0,18229	0,15864	0,518	-0,2096	0,5742
	Over 2 years	Under 1 year	0,26415	0,16894	0,297	-0,1531	0,6814
		1 to 2 years	-0,18229	0,15864	0,518	-0,5742	0,2096
Project_rep Project Reputation	Under 1 year	1 to 2 years	.33893*	0,12119	0,022	0,0396	0,6383
		Over 2 years	0,31728	0,18936	0,249	-0,1505	0,7850
	1 to 2 years	Under 1 year	-.33893*	0,12119	0,022	-0,6383	-0,0396
		Over 2 years	-0,02166	0,17781	0,993	-0,4609	0,4176
	Over 2 years	Under 1 year	-0,31728	0,18936	0,249	-0,7850	0,1505
		1 to 2 years	0,02166	0,17781	0,993	-0,4176	0,4609
Project_cost Project costs, deadlines and scope	Under 1 year	1 to 2 years	0,19217	0,12625	0,316	-0,1197	0,5040
		Over 2 years	.82142*	0,19727	0,000	0,3341	1,3087
	1 to 2 years	Under 1 year	-0,19217	0,12625	0,316	-0,5040	0,1197
		Over 2 years	.62925*	0,18524	0,004	0,1717	1,0868
	Over 2 years	Under 1 year	-.82142*	0,19727	0,000	-1,3087	-0,3341
		1 to 2 years	-.62925*	0,18524	0,004	-1,0868	-0,1717

Project_eff Project efficiency	Under 1 year	1 to 2 years	0,12719	0,09238	0,390	-0,1010	0,3554
		Over 2 years	.38332*	0,14435	0,032	0,0268	0,7399
	1 to 2 years	Under 1 year	-0,12719	0,09238	0,390	-0,3554	0,1010
		Over 2 years	0,25612	0,13555	0,171	-0,0787	0,5909
	Over 2 years	Under 1 year	-.38332*	0,14435	0,032	-0,7399	-0,0268
		1 to 2 years	-0,25612	0,13555	0,171	-0,5909	0,0787
Project_sucess Project sucess total	Under 1 year	1 to 2 years	0,01162	0,07457	0,988	-0,1726	0,1958
		Over 2 years	.31238*	0,11652	0,030	0,0246	0,6002
	1 to 2 years	Under 1 year	-0,01162	0,07457	0,988	-0,1958	0,1726
		Over 2 years	.30076*	0,10942	0,025	0,0305	0,5710
	Over 2 years	Under 1 year	-.31238*	0,11652	0,030	-0,6002	-0,0246
		1 to 2 years	-.30076*	0,10942	0,025	-0,5710	-0,0305
Shareholder_stakeholder Shareholder vs stakeholder	Under 1 year	1 to 2 years	-0,33743	0,14018	0,058	-0,6837	0,0088
		Over 2 years	0,03915	0,21903	0,984	-0,5019	0,5802
	1 to 2 years	Under 1 year	0,33743	0,14018	0,058	-0,0088	0,6837
		Over 2 years	0,37658	0,20568	0,190	-0,1315	0,8846
	Over 2 years	Under 1 year	-0,03915	0,21903	0,984	-0,5802	0,5019
		1 to 2 years	-0,37658	0,20568	0,190	-0,8846	0,1315
Behaviour_outcome Behaviour vs outcome control	Under 1 year	1 to 2 years	-0,14666	0,13297	0,545	-0,4751	0,1818
		Over 2 years	0,14838	0,20777	0,775	-0,3648	0,6616
	1 to 2 years	Under 1 year	0,14666	0,13297	0,545	-0,1818	0,4751
		Over 2 years	0,29504	0,19510	0,321	-0,1869	0,7770
	Over 2 years	Under 1 year	-0,14838	0,20777	0,775	-0,6616	0,3648
		1 to 2 years	-0,29504	0,19510	0,321	-0,7770	0,1869

*. The mean difference is significant at the 0.05 level.

9.7 Appendix 7 – Consistency matrix

Hypotheses	Literature Review	Data Collection Tool	Analysis
Hypothesis One: A project governance process that favours a stakeholder approach has a positive relationship with successful project outcomes.	Baccarini, 1999; Badewi, 2016; Bekker & Steyn, 2008; Biesenthal & Wilden, 2014; Califf, Beaulieu & Martin, 2012; Davis et al., 1997; Donaldson & Davis, 1991; Gilson, 1996; Joslin & Müller, 2016; Jensen & Meckling, 1976; Khan, Turner & Maqsood, 2013; Klakegg et al., 2008; Mabert, Soni & Venkataramanan, 2001; Müller & Jugdev, 2012; Müller & Lecoeuvre, 2014; Pastoriza & Ariño, 2008; Pinto, 2014; Pinto & Prescott, 1988; Pinto & Slevin, 1988; Shenhar et al., 2001; Wang & Chen, 2006; Westerveld, 2003; Wiseman et al., 2012 ul Musawir, Serra, Zwikael & Ali, 2017 Yusoff & Alhaji, 2012 Zwikael & Smyrk, 2012	Sections 1 and 2 of survey	The answers for the questions will be formed into individual scores per construct. And each construct score will be analysed through linear regression analysis to identify if a quantifiable relationship exists.
Hypothesis Two: A project governance approach that favours behavioural and strict process control will have a positive relationship with successful project outcomes.	Baccarini, 1999; Badewi, 2016; Bekker & Steyn, 2008; Biesenthal & Wilden, 2014; Califf, Beaulieu & Martin, 2012; Davis et al., 1997; Donaldson & Davis, 1991; Gilson, 1996; Joslin & Müller, 2016; Jensen & Meckling, 1976; Khan, Turner & Maqsood, 2013; Klakegg et al., 2008; Mabert, Soni & Venkataramanan, 2001; Müller & Jugdev, 2012; Müller & Lecoeuvre, 2014; Pastoriza & Ariño, 2008; Pinto, 2014; Pinto & Prescott, 1988; Pinto & Slevin, 1988; Shenhar et al., 2001; Wang & Chen, 2006; Westerveld, 2003; Wiseman et al., 2012 ul Musawir, Serra, Zwikael & Ali, 2017 Yusoff & Alhaji, 2012 Zwikael & Smyrk, 2012	Sections 1 and 3 of survey	

9.8 Appendix 8 – Ethical clearance

Gordon Institute of Business Science
University of Pretoria

12 October 2018

Stricker Kyle

Dear Kyle

Please be advised that your application for Ethical Clearance has been approved.

You are therefore allowed to continue collecting your data.

Please note that approval is granted based on the methodology and research instruments provided in the application. If there is any deviation change or addition to the research method or tools, a supplementary application for approval must be obtained

We wish you everything of the best for the rest of the project.

Kind Regards

GIBS MBA Research Ethical Clearance Committee