Gordon Institute of Business Science
University of Pretoria

# Top management support: a contingent factor towards user participation in ERP project success

**Craig Andrew Swanepoel**

**Student Number: 17367965**

An article submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree Master of Business Administration.

7 November 2018

**DECLARATION**

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree 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.

_____

Craig Andrew Swanepoel

7 November 2018

**CONTENTS**

## LIST OF TABLES



## LIST OF FIGURES

# 1 COVER LETTER

5 November 2018

To whom it may concern

**Identification of and motivation for target journal**

The title of the article which we aim to publish is “Top management support: A contingent factor towards user participation in ERP project success”. The name of the journal that has been chosen for this article is Business Process Management Journal (BPMJ).

BPMJ aims to provide its readers with an extensive range of updated knowledge in the field of business processes, which the journal cites as a cornerstone of organisational success. Through adopting a process approach, the journal’s focus is on driving organisational efficiency, effectiveness and competitiveness. From the “aims and scope” section of the journal, it is clear that there is a strong technology theme in the journal’s coverage, including Enterprise Resource Planning (ERP).

With ERP systems at the core of modern organisations, and with the objective of integrating the complete range of business processes, the implementation of an ERP system creates tremendous change in people’s work, business processes and organisational performance. Considering the positive organisational impact that a successful technology project such as an ERP implementation can have, it is appropriate that this research be considered for publication in BPMJ, as it adds to the body of knowledge that this journal’s community demands.

According to the Association of Business Schools (ABS) 2018 academic journal guide, BPMJ is a two-rated journal. The 2017 Journal Citation Report indicates an impact factor of 1.308 for BPMJ, while Scopus indicates a CiteScore of 1.97. The chosen journal, BPMJ, is indexed in Scopus 2018 and is published by Emerald Group Publishing Ltd.

The author guidelines published by the journal, and included as a hard copy supporting document, indicate that journal articles should be between 8000 and 10000 words, including allowances for tables, figures, references and appendices. The submitted article includes 8418 words (exclusive of words in tables and figures), four tables and

two figures. Allowing 280 words for each table and figure, the effective article length is 10098 words. The author guidelines call for adherence to Harvard style referencing, which has been complied with. A complete structured abstract in line with author guidelines has also been included.

In terms of the sequence of authorship, the researcher will be the first and corresponding author and the second author will be the researcher's supervisor.

Should you have any concerns, please do not hesitate to contact either myself or my supervisor on the details provided below.

Yours sincerely,

Craig Andrew Swanepoel


| | |
|---|---|
| Researcher: | Craig Andrew Swanepoel |
| Email: | 17367965@mygibs.co.za |
| Mobile: | 083 541 1594 |

| | |
|---|---|
| Research Supervisor: | Dr Tumo Kele |
| Email: | kelet@gibs.co.za |
| Mobile: | 082 344 5862 |

# 2 INTRODUCTION TO THE RESEARCH PROBLEM

## 2.1 Research title

Top management support: A contingent factor towards user participation in ERP project success

## 2.2 Research problem and purpose

According to Liu, Wang and Chua (2015), “IT project success remains an elusive goal. Only one third of IT projects succeed” (p. 708). The Project Management Institute (2016) supported this view stating that “fewer projects were completed within budget or met the original goals or business intent” (p. 2). In fact, more projects failed and resulted in monetary loss for their organisations. In the context of a shift towards a digital economy, Information Systems (IS) projects will become more in number, larger in investment value and higher in strategic importance, with the objective of providing organisations with distinct advantages over their peers.

In their 2014 Project Smart survey in the USA (Standish Group, 2014), the Standish Group found that only 16.2 percent of projects were considered successful, with 52.7 percent of projects challenged and 31.1 percent cancelled. Challenged projects were completed over budget, late and offered fewer features and less functionality than originally required by business.

Based on their 2016 research, Ganly (2016) found that up to 25% of ERP projects were delivered late, over budget, failed to deliver the anticipated benefits or were abandoned. A further 50% to 60% of Enterprise resource planning (ERP) projects were viewed by organisations as being compromised, typically due to the inability to identify the benefits.

ERP systems are complex information systems that augment organisational and individual users’ productivity (Hwang, 2014). With ERP systems at the core of organisations (Costa, Ferreira, Bento & Aparicio, 2016), and people as the users of these systems, business managers should be interested in the factors that make these projects a success, particularly those factors that are within their control and can be leveraged.

Due to the strategic importance of these IS projects, the determinants of their success deserve special managerial attention (Petter, DeLone & McLean, 2013). Some of these

determinants are within the control of management, while those that are not within management control, can be influenced by managers.

In their third paper, Petter et al. (2013) set out to identify the important independent variables, that through prior studies, have consistently shown to be contributors to IS success. While their research was useful in that it highlighted the strongest variables to have influenced IS success, they did not empirically test their findings.

Based on a review of the literature, the objective of this research is to test the two strongest independent variables, both of which are under management's control, but this time in the developing country context of South Africa. Developing country environments are significantly different to where the previous findings have been established, namely in developed markets. These variables are top management support and user participation. The significance of these determinants being under management's control, is that they are endogenous to the organisation and can be used as levers to enhance the success of ERP projects. management can use them as "levers to improve the chances of success of their IS investments" (Petter et al., 2013, p 45).

Petter et al. (2013) argue that as much as 80 percent of an information system's benefits are realised after going live, in other words, from its long-term use. Gable, Sedera and Chan (2008) reinforce this view, stating that an IS project is a long-term investment, which is expected to yield ongoing benefits into the future. Amoako-Gyampah (2007) and Petter et al. (2013) observe that organisations tend to neglect the role of the system's end user. User participation from as early on as the requirement gathering and system design phases, is believed to positively influence user acceptance, system use and ultimately user satisfaction (Amoako-Gyampah, 2007).

This study makes two management contributions. First, this study draws management attention to the important contribution of the end-user community, throughout the project life cycle. Petter et al. (2013) and Popovič, Hackney, Coelho and Jaklič (2014) argue that when assessing IS project success, management typically place the focus on specific aspects of the system, project or organisation and neglect the use of the system and whether the users are indeed satisfied with the system. This narrow view of success excludes the perspective of one of the most important stakeholders in the organisation, the user.

Second, by building on extensive research in the IS field, this research seeks to add to the body of knowledge in IS success, by focusing on the human-factor determinants of

success that are within management control. These determinants of IS project success are posited to be universal across country contexts and IS project contexts. However, very little research has been done to test these success factors in the context of ERP projects in South Africa.

Given the context that has been outlined above and, in their quest to remain relevant, organisations are increasingly undertaking technology projects, including ERP projects. Yet, despite significant investment and recognition of the strategic importance of these IS projects, a significant number of them fail. Based on the contingent factors that have consistently demonstrated to positively impact IS project outcomes, this research sets out to validate these in the South African and ERP project implementation contexts.

## 2.3 Research motivation

Although the IS field has been extensively researched, researchers remain divided in terms of their findings, with findings being inconsistent and ambiguous (Popovič et al., 2014). Prior research has primarily focused on either the dependent variables of IS success, or the relationship between specific success factors (independent variables) and specific dimensions of IS success (dependent variables).

Chen, Yen, Pornpriphet and Widjaja (2015) and Petter et al. (2013) make a case for further research into the relationships between independent success factor variables, to understand whether their interactions contribute positively (or negatively) to success level. This recommendation suggests that there is a gap in the knowledge of what causes IS success.

This research therefore seeks to combine and build on prior research in the IS field, with a focus on the relationship between two success factors: top management support and user participation. These constructs will be empirically tested to determine their influence on ERP project success.

The next section of this paper will review existing academic literature, on the key constructs of this research, to build an argument for the need for further research. The literature review section will conclude by presenting a conceptual model. The final section will outline the proposed research methodology, which will be used to achieve the research objectives.

# 3 THEORY AND LITERATURE REVIEW

## 3.1 Introduction

There are many hypothesised antecedents of IS success, with a wide range of definitions for each antecedent. The DeLone and McLean IS Success model (D&M IS Success model) demonstrates that there is no single determinant that leads to IS project success (Ghobakhloo & Tang, 2015; Petter et al., 2013). The D&M IS Success model suggests that several factors, if present, can improve the chances of IS project success. Chen et al. (2015), Ghobakhloo and Tang (2015), Petter et al. (2013) and Popovič et al. (2014) have noted that several gaps remain in the IS domain literature, which present an opportunity for this research.

Pankratz and Basten (2017) argue that most research on IS project success has focused on the independent variables (determinants) or the dependent variable (success criteria), but very little attention has been focused on the relationships and impact between the success factors. Based on the literature, the researcher has chosen to examine two variables that have consistently demonstrated to positively influence ERP project outcomes, top management support and user participation.

Kulkarni, Robles-Flores and Popovič (2017) contend that previous IS research has focused on the relationship between top management support and IS success, but has largely ignored user participation as a contributor to project success. As the relationship between these independent variables has not been empirically well researched, the researcher has elected to examine the role of top management support in influencing user participation. When taken together, these success factors may have a more significant impact on ERP project success.

## 3.2 Enterprise resource planning (ERP)

According to Statista, (n.d.), global ERP software market revenues in 2016 exceeded 82 billion dollars. The top five ERP vendors represented more than half of the global market and included SAP (24%), Oracle (12%), Sage (6%), Infor (6%) and Microsoft (5%) (Costa et al., 2016).

For a definition of Enterprise Resource Planning (ERP), the definition put forward by

Costa et al. (2016) has been borrowed. “Enterprise Resource Planning (ERP) systems are defined as comprehensive, packaged software solutions that seek to integrate the complete range of a business’ processes and functions, in order to present a holistic view of the business from a single information and IT architecture” (p. 659).

The above definition establishes an ERP project as a form of IS project. ERP projects can be extremely complex, have lengthy implementation timelines and typically involve cross-functional stakeholders. The complexity referred to, “creates tremendous change in people’s work, business processes and organisational performance. For this reason, they are termed techno-change projects” (Liu et al., 2015, p. 709).

ERP systems were historically implemented with the objective of centrally integrating all business functions to increase effectiveness and operational efficiency (Morris & Venkatesh, 2010). However, with the proliferation of the digital business in the modern era, ERP has become a vital enabler towards a digital business. As the system-of-record that cuts across most business functions, ERP systems provide the foundational layer essential to supporting digital business strategy in the modern era.

Due to the ubiquitous impact that ERP projects can have, it is imperative that top management express a clear vision and business purpose for the project. Clearly and consistently communicating this vision and expressing the quantifiable objectives can alleviate anxiety about the impending change and in so doing, obtain organisational and individual support necessary for success (Amoako-Gyampah, 2007). Top management teams that fail to commit themselves and their organisations to ERP system implementations will find themselves at a competitive disadvantage.

ERP is a comprehensively researched field of study in which success is the dominant topic (Costa et al., 2016), thus leaving other topics in the field open for more contributions. Considering the significant investment and central importance of ERP projects, Ram, Corkindale and Wu (2013) highlight the need for a better understanding of ERP implementation success factors to assist organisations to successfully execute their ERP strategies. Of the many factors that contribute to ERP project success, the human factors are often considered to have the greatest influence (Hiebl, Gärtner & Duller, 2017). The underlying technology itself is seldom the primary determinant of ERP system implementation success (Hiebl et al., 2017; Morris & Venkatesh, 2010).

## 3.3 Development of conceptual model

### 3.3.1 Top management support and ERP project success

Top management support is broadly regarded as the willingness of management in the senior-most positions of an organization, to allocate their time, resources and encouragement to the development and use of the ERP. Gable et al. (2008) suggest that top management play a critical role in contextualizing the project objectives, in a way that is aligned to the organizational strategy. A review of the literature on IS success offers the following broad definition of management support: "top-management support for, and favourable attitude toward, ISs in general" (Sabherwal, Jeyaraj and Chowa, 2006, p. 1851). Liu et al. (2015) extend this definition by suggesting that top management support goes beyond resourcing the project, and includes active participation and involvement by top management.

Through their qualitative research review of 140 studies, which allowed for a broad identification of IS success factors, Petter et al. (2013) concluded that "management support is probably the most supported organisational characteristic that predicts IS success" (Petter et al., 2013, p. 27). Many other studies support the notion that top management support is a critical factor for the success of IS projects (Costa et al., 2016; Dong, Neufeld & Higgins, 2009; Elbanna, 2013; Kulkarni et al., 2017; Lee, Shiue & Chen, 2016; Liu et al., 2015; Sharma & Yetton, 2003).

Liu et al. (2015) and Amoako-Gyampah (2007) argue that the lack of management support is a major contributor for IS project failure. Management commitment and involvement are critical for the removal of obstacles, conflict resolution and to ensure alignment of all stakeholders towards a common goal (Costa et al., 2016). As an active project participant and supporter, top management can significantly support the project through the early detection and mitigation of risks.

Akkermans and van Helden (2002) theorised that success factors are "closely causally related and, hence, changes in any of them will ripple through in all others, as they reinforce each other in the same direction" (p. 280). Failure in any success factor, particularly a crucial factor such as top management support, would therefore have a negative multiplier effect on all other factors (Elbanna, 2013).

Liu et al. (2015) go on to argue that top management support and executive leadership

are essential attributes for projects that cut across functional, divisional and geographic boundaries. Top management participation is necessary to create and communicate a shared vision, and to align all levels and cross-sections of management and the broader user community, to a common understanding of the new ERP system's objectives. Top management has a key role to play in the facilitation of decision making across these disparate groups. A lack of unity within the broader management team will likely compromise the ERP project's success.

For a large-scale ERP project, it is essential that top management facilitates the establishment of an interface between what is typically a temporary project team, and the more permanent functional or divisional groups. To support this notion, Liu et al., (2015) and Ram et al. (2013) found that the top managers in organisations with successful IS projects, consistently reinforced the importance of critical success factors, such as user involvement and interdepartmental collaboration and communication.

Implementing ERP is a constant stream of decisions and changes to business processes which cannot be resolved properly without strong and enduring top management support.

Top management support has become an umbrella term covering three closely related categories of top management support: resource provision, management participation and management involvement (Liu et al., 2015).

#### 3.3.1.1 Resource provision

ERP projects typically require financial resources, human capital resources (staff) and equipment (technology) (Dong et al., 2009; Liu et al., 2015; Sharma & Yetton, 2003). Failure to adequately resource a project across all resource dimensions will render any other top management efforts ineffective.

As alluded to earlier, most of the benefits from an ERP project accrue in the future, after going live with the system. Gable et al. (2008) challenged two dependent variable constructs of the D&M IS success model: system quality and information quality. They argued that these dimensions of IS success were formative as opposed to reflective, suggesting that system quality and information quality lead to future impact (organisational and individual), and therefore ongoing benefits and success (or failure) in the long run. To maximise these benefits and to promote system build quality, management should assign sufficient appropriately-skilled, experienced and respected

staff to the project (Liu et al., 2015).

The allocation of sufficient and suitable staff to the project will advance the formation of relationships between top management, the user community, key users and the technical implementation team, which will yield reciprocal value in the post-implementation period. When project teams design solutions and provide project services with the assistance of users, there is a shared understanding between system users and solution providers (Sun, Fang, Lim & Straub, 2012).

#### 3.3.1.2 Management participation

The literature strongly suggests that top management must participate and be present for the entire project (Liu et al., 2015). The top management team needs to act in a manner that establishes and unambiguously communicates the project's priority within the organisation. Top management's engagement with the user community should include communication regarding the project's direction and progress, business process changes and the anticipated business benefits that the ERP project is expected to yield.

Top management should not confuse participation with assuming a key user role (Liu et al., 2015). The fulfilment of key user roles should be entrusted to middle management and senior employees, allowing top management to maintain their strategic and leadership orientation.

Middle management should be included from the early stages of the project, preferably as early as the selection process. Through their early participation, middle management not only accept the vision, but become deeply committed to it, acting as evangelists for the project (Dong et al., 2009). The support shown by top management cascades down in the organisation through middle management, and ultimately to the system users. In their evangelist role, middle management act as change agents, creating heightened levels of trust amongst the broader user community and the project team. Top management need to support middle managers with the removal of impediments that compromise the achievement of the vision. Importantly, however, middle management participation does not replace the crucial role of ongoing top management participation.

Acting as coach, top management should take an active role in leading the ERP project, motivating and uniting the project team and user community towards this common goal.

#### 3.3.1.3 Management involvement

Through ongoing and publicly-visible involvement (in word and action), top management demonstrates their commitment to the project's success (Liu et al, 2015). Examples of manifestations of top management involvement include: attendance of all necessary meetings by top management, regular mentions and promotion of the project and the project team, regular informal conversations with the project leadership team, regular visits to the project office and actively soliciting feedback (Dong et al., 2009; Elbanna, 2013). The conduct of the top management team sets the example for other stakeholders to follow.

As stated by Morris and Venkatesh (2010) and supported by Cummings and Worley (2015), the implementation of an enterprise-wide information system is a significant change event for most organisations. Having visible top management support and commitment for an ERP implementation, significantly enhances organisational support for change (Kim & Kankanhalli, 2009).

The literature is not clear about what constitutes top management. Some studies consider top management to be the CEO along with those who report to the CEO (collectively the c-suite), while other studies regard top executives in the most senior positions to be top management (Liu et al., 2015). For this research study, top management is regarded as those individuals in the senior-most positions of an organisation, typically involved in strategic decision making, irrespective of title.

Due to the long project durations that are typically associated with ERP projects, top management should prioritise their continued project involvement and ongoing stewardship throughout the project (Gable et. al, 2008). Furthermore, the complexity of ERP projects highlights the need for top management to adjust their behaviours and levels of support throughout the project; their actions cannot be static (Dong et al., 2009).

The D&M IS Success model is regarded as the most cited IS success model and has made a valuable contribution towards the understanding of information systems success (Gable et al., 2008). In their 1992 seminal paper, DeLone and McLean introduced their original D&M IS Success model, suggesting that "IS success should be the preeminent dependent variable to define IS success" (Dwivedi et al., 2015, p. 145). DeLone and McLean identified several dimensions of IS success, the most dominant of these being system use. The other dimensions of IS success were system quality, information quality, intention to use, user satisfaction, individual impact and organisational impact

(Dwivedi et al., 2015). In a 2003 update to their D&M IS Success Model, individual impact and organisational impact were collectively categorised as net benefits, and a new dimension was included: service quality (Dwivedi et al., 2015; Petter et al., 2013).

From the literature, IS success is a multidimensional and multifactorial construct that is dependent on context and perspective (Dwivedi et al., 2015; Gable et al., 2008). The hierarchical role of key users from which IS success is being assessed, influences the criteria for the measurement of IS success. The organisational level at which a system's impact is being assessed adds even more complexity.

Gable et al. (2008) critiqued the D&M IS Success model, arguing that the "use" dimension of success is a determinant of success, rather than a measurement of success. In an era of mandated use, particularly the use of ERP systems, system use cannot be regarded as a measure of IS success.

Gable et al. (2008) further argued that the "user satisfaction" dimension was not a separate dependent variable dimension of IS success. They based this argument on their research findings, which indicated that the majority (98 percent) of user-satisfaction measures mapped directly to existing measures of quality (system and information) and impact (individual and organisational). Therefore, they concluded that "user satisfaction" is not a separate dimension of IS success, but rather a consequence of IS impact.

Gable et al. (2008) contributed an alternative model of IS success, the IS-Impact measurement model, that operationalised important dependent variables from prior research. Organisations evaluate their systems for various reasons. Of these reasons, Gable et al. (2008) postulate that the ultimate measure of an information system's success is the positive impact that it delivers to the organisation, as well as to the individual users.

> ***$H_1$a:*** *Top management support positively influences the impact of an ERP project on individual users*
>
> ***$H_1$b:*** *Top management support positively influences the impact of an ERP project on the organisation*

### 3.3.2 Top management support and user participation

Petter et al. (2013) contend that the two most significant determinants of user satisfaction, one of their dimensions of IS success, are user involvement and top management support. Top management support was introduced in the previous section. The terms “user involvement” and “user participation” are often used interchangeably in the reviewed literature. Petter et al. (2013) define user involvement as “the degree to which users participate and are involved in the IS development and implementation process”, (p. 17). Other authors prefer to use the term user participation, which can be defined as the “behaviours and activities that users perform in the information systems development (ISD) process” (He & King, 2008, p. 302). From the above definitions, we can conclude that a user is involved through their participation. Consistent with Kulkarni et al. (2017), this study has elected to use “participation as a proxy for measuring involvement because participation is an observable behavioural construct” (p. 523).

Kulkarni et al. (2017) and Sun et al. (2012) contend that IS development methods such as agile development, joint application design, participative design and user-centred design, all highlight the importance of user participation. These methods contribute towards the development of trust and the fostering of stakeholder alignment towards a common goal. User participation is fundamental to the success of the project, as each stakeholder brings their set of domain experience and co-creates the solution design, such that it ultimately meets individual-user as well as organisational requirements (Davis, Kettinger & Kunev, 2009). Employees who understand the reasons for change and who have input into designing the new processes and ways of working, are more likely to accept and adopt the new ERP system (Nwankpa & Roumani, 2014). While top management teams do not possess the technical capability nor the time to directly contribute to the project, their active support and influence can encourage users to meaningfully contribute to project outcomes (Kulkarni et al., 2017).

Top management has a responsibility to create conditions that are conducive to user participation. Within this participative climate, top management teams should elevate passive system user involvement to active participants that not only contribute to the initial system design, but who remain committed to continually improving the system. Active participation can be achieved through interventions such as requesting regular feedback and suggestions, critical evaluation of system functionality, experimenting with new features and requesting system enhancements (Kulkarni et al., 2017).

ERP systems are long-lived investments that must continually evolve to support business outcomes in an ever-changing business environment. Top management must recognise that ERP systems are implemented to support a business strategy, not an IT strategy. Although technology underpins an ERP initiative, business should ultimately be responsible for the delivery of an ERP project, supported by the IT department for technology enablement.

User participation is closely linked to top management support. The absence of top management support will be manifested through an inappropriate allocation of key departmental users to participate in significant project activities. These key activities include the specification of user's requirements, training, testing and the validation of design. It is important that suitably experienced and senior key users with deep business knowledge be assigned to the project in a full-time capacity to represent their departmental, divisional or functional user community (Davis et al., 2009; Liu et al., 2015). To maximise the impact of user participation, users need to be allowed to take time away from their regular duties (Dong et al., 2009). Top management have a crucial role to play in endorsing and supporting the secondment of human resources to the project.

Elbanna (2013), Hiebl et al. (2017), Sabherwal et al. (2006) and Sharma and Yetton (2011) strongly advocate top management support as a determinant of IS project success, highlighting the important role that top management plays in facilitating conditions for success. One of the notable conditions is user participation, which leads to greater IS success. Multiple studies have concluded that many ERP project implementations do not realise their promised potential due to a lack of support from users during the post-implementation phase (Rezvani, Khosravi & Dong, 2017). The long-term value of ERP investments can be eroded by a lack of top management support and inadequate and ineffective user participation.

***$H_2$:*** *Top management support has a positive influence on securing user participation during an ERP project*

### 3.3.3 User participation and ERP project success

As introduced earlier, user participation has been a well-cited success factor for project success. Dwivedi et al. (2015) and Hiebl et al. (2017) contend that human-related factors are among the top reasons for project failure, with lack of user participation posited to be amongst the strongest determinants.

Dwivedi et al. (2015) argue that a central step in IS design is to identify the problem before proposing solutions. This view strongly supports the notion of involving users early in the project, to gather their requirements and secure their buy-in and alignment towards the core purpose of the project. Collaboration, which is only possible through active user participation, is thought to positively contribute to IS success. When middle managers and users are involved in system design processes, they experience a sense of system ownership that manifests in system quality, user satisfaction and an ongoing commitment to their system (Dong et al., 2009; Kulkarni et al., 2017).

Sabherwal et al. (2006) suggest that inclusive user participation throughout the design process, yields positive user attitudes toward the ERP. Users with a positive attitude are, in general, more likely to make more valuable contributions to the project. Rather than simply regarding users as consumers of value, Sun et al. (2012) propose that users be endogenous to the co-creation of system value through "combining their business competences with IT competences" (p. 1196) of the project team. This collaborative and relational view of project delivery will set contemporary firms apart in their pursuit of success in a highly competitive and global business environment.

> ***$H_3$a:*** *User participation positively influences the impact of an ERP project on individual users*

> ***$H_3$b:*** *User participation positively influences the impact of an ERP project on the organisation*

### 3.3.4 Conceptual model

From the literature reviewed, research hypotheses have been formulated. Figure 1 is a graphical representation of the conceptual model which will be tested to understand the relationships between the constructs.

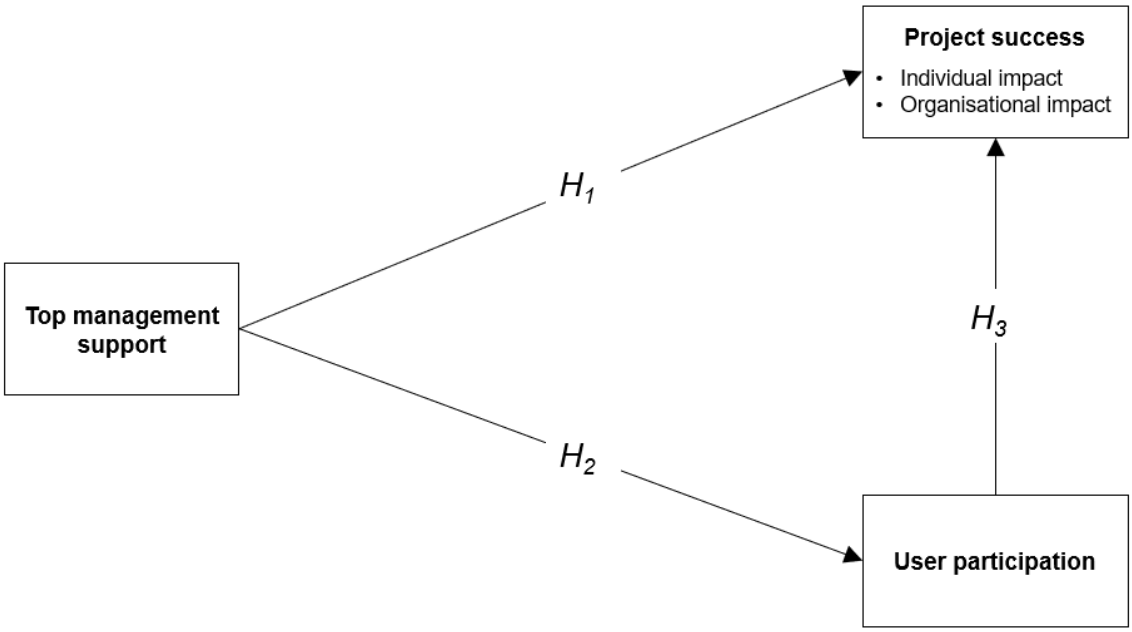


***Figure 1:*** *Conceptual model*

## 3.4 Conclusion

A review of the literature highlights several gaps. Firstly, the user participation construct has not received sufficient attention. While it has been identified as a moderately strong determinant of IS success (Dwivedi et al.; 2015; Hiebl et al., 2017), it remains to be seen how user participation influences ERP project success. Secondly, top management support as a determinant of IS success has been empirically studied; however, the relationship between top management support and user participation, both as independent variables, has not been adequately studied in the IS literature.

# 4 RESEARCH METHODOLOGY AND DESIGN

## 4.1 Introduction

The primary goal of this research was to understand the relationship between two human-factor determinants of ERP project success – top management support and user participation, as well as the relationship between each of these independent variables and the dependant variable, project success. Chapter two provided a critique of current literature in IS research and the ERP domain. The literature strongly suggests that ERP is more about people than the underlying technology, highlighting the need to pay special attention to the human-related factors of these projects.

This chapter outlines the research methodology that was used to address the research objectives stated earlier in this text. The research design, the population, the unit of analysis, the sampling method and sampling size, the measurement instrument, the data collection process, the data analysis approach and the methodological limitations will be discussed.

## 4.2 Research design

A quantitative approach was used for this research study. According to Yilmaz (2013), quantitative research is a suitable research method for a researcher who wants to empirically test whether theory explains phenomena of interest. Saunders and Lewis (2012) contend that the chosen research strategy must enable the researcher to meet the research questions, and ultimately the research objectives. The research strategy should therefore be guided by the research questions, as well as the extent of the researcher's existing knowledge and available theory.

The research used a deductive research approach, as deductive research involves the use of existing theory to develop hypotheses that are subjected to rigorous testing (Saunders, Lewis & Thornhill 2009). It is important that the various elements of the research methodology are aligned. A deductive approach lends itself to a positivist approach, as the research can yield law-like generalisations through the testing (statistical analysis) of hypotheses that were developed using existing theory (Saunders, et al., 2009). The researcher was interested in credible facts, rather than impressions.

This research made use of a single data collection technique, which Saunders, Lewis and Thornhill (2009) define as mono method. The data collection technique took the form of a self-administered online survey questionnaire, which yielded primary data. The questionnaire was distributed via an e-mail containing a hyperlink to the actual questionnaire. Since the questions were standardised, the data could be analysed statistically. The main benefit of using a standardized instrument is that it allows researchers to statistically compare and aggregate data from many respondents, achieving a generalizable set of findings (Yilmaz, 2013). This is consistent with descriptive research.

A survey strategy facilitates the collection of quantitative data, is usually associated with the deductive approach and is most frequently used to answer questions of who, what, where and how many (Saunders et al., 2009).

Saunders and Lewis (2012) defines a descriptive study as research that seeks to produce an accurate representation of persons, events or situations, and should be thought of as a means to an end, rather than an end in itself. Since the research objective of this study was to test and validate the relationship between the antecedents of IS project success and not to explain why they occur, descriptive research was performed.

Due to time constraints and for reasons of pragmatism, this research was a cross-sectional study, meaning that the data was collected at a point in time. A cross-sectional study is often referred to as a 'snapshot' (Saunders, Lewis & Thornhill, 2009).

## 4.3 Population

According to Saunders and Lewis (2012), a population is the complete set of group members that have common characteristics. The population for this research comprised all users of ERP systems that are employed by South African companies. From this statement, there were two population groups: South African companies that have implemented ERP systems, and the users of these ERP systems. Due to the scale and cost of most ERP projects, it was necessary to include companies that have implemented a new ERP system within the last five years.

## 4.4 Unit of analysis

The unit of analysis for this research was the individual employees of these companies – the users of the ERP systems. The researcher determined the unit of analysis in line with the research problem (Adams, 2007). Data was collected from individual ERP users of South African companies that have implemented a new ERP system within the last five years.

## 4.5 Sampling method and size

For many research questions, it would not be practical to collect data from the entire population – these practical considerations include cost and time (Saunders et al., 2009). Sampling makes it possible to generate findings that are representative of the entire population. Sampling is the process of selecting a suitable subgroup of the whole population (Adams, 2007). There are two basic sampling techniques available to researchers – probability or representative sampling, and non-probability or judgemental sampling (Saunders et al., 2009). A probability sample can be defined as a sample in which every element of the population has an equal chance of being selected. In contrast, if elements are selected based on judgement, the sampling method is non-probability sampling (Adams, 2007).

Since most companies use ERP systems, it was not practical due to time and budgetary constraints to send out questionnaires and obtain responses from all individual users of these systems. It would also be difficult to source a complete sampling frame of all these individual users to allow for probability sampling.

This study therefore made use of non-probability sampling. According to Saunders et al. (2009), non-probability sampling offers numerous alternative approaches to selecting a suitable sample and is used when researchers are unable to source a sampling frame.

The sampling methods that were used are outlined in Table 1 below.

***Table 1:*** *Sampling methods for each population and sampling unit*

| Population | Description | Sampling unit | Sampling method |
|---|---|---|---|
| Primary population | SA companies that have implemented an ERP system within the last five years. | Primary sampling unit | Judgement and snowball sampling |
| | Users of the implemented ERP that were employed by the company when the ERP was implemented. | | Quota sampling |

As proven by the central limit theorem, Wegner (2016) explains that the minimum sample size for parametric statistical tests to be performed is 30 responses. Saunders et al. (2009) warns that a 100% response rate is unlikely, so the sample needed to be large enough to ensure sufficient responses to provide the researcher with the necessary confidence in the data.

To increase the statistical power of the research, a sample size of 100 responses was targeted. Saunders et al. (2009) suggests that a 30% response rate for internet-administered questionnaires within an organisation is a reasonable assumption. Considering a response rate of 30 percent, the questionnaire therefore needed to be distributed to a minimum of 334 ERP users. This was calculated by dividing the targeted responses by the response rate, using the 'actual sample size required' formula (Saunders et al., 2009).

The researcher has experience in the implementation of ERP systems and has an established network that he accessed. Guided by this experience, the researcher believed that five organisations would yield the required responses from the sampling unit of ERP users. Of the five companies that were approached, three companies agreed to participate in the research. With the assistance of management from the participating companies, the survey was sent to 970 ERP users.

### 4.6 Measurement instrument

The measurement instrument took the form of a questionnaire, which was distributed to ERP system users as an online survey. The first part of the questionnaire served to introduce the respondents to the research and to offer guarantees about confidentiality and anonymity. The second part of the questionnaire began with two screening questions, with the first question serving to isolate respondents that were not employed by the organisation at the time of the EPR implementation. Thereafter, six questions served to collect selected demographic data about the respondents.

All questions for the survey questionnaire were obtained from literature. An in-depth review of relevant empirical studies revealed the existence of several validated instruments, which had been previously operationalized by other researchers. All instruments were highly cited and published in top journals. Making use of these existing instruments to test the constructs of this study provided a strong foundation for instrument consistency and validity (Marble, 2003). Where necessary, the author adapted the wording to make the questions relevant to the study.

The dependent variable, project success, was measured in terms of two sub-variables; individual impact and organization impact. Questionnaire items for both sub-variables of this construct were obtained from Gable et al. (2008). Four items derived from Yoon et al. (1995) were used to measure top management support. User participation was measured using an instrument developed by Doll and Torkzadeh (1989). Where necessary, the authors adapted the wording to make the questions relevant to the study. Table 2 summarises the source of the instruments which were used in this study. The complete instruments are included in Appendix 2 of this document.

***Table 2:*** *Instruments*

| **Construct** | **Source of instrument** |
|---|---|
| User participation | Doll and Torkzadeh (1989) |
| Top management support | Yoon, Guimaraes and O'Neal (1995) |
| Project success<br>• Individual impact<br>• Organisation impact | Gable, Sedera and Chan (2008) |

Other than the demographic data which was collected in Section A of the questionnaire, all other questions were answered using a five-point Likert scale. The scale anchors were included in the preamble of each section of the questionnaire. There were 31 questions in total, including the demographic questions.

Saunders and Lewis (2012) classify validity into categories: content validity and construct validity. Ensuring that your questionnaire will provide sufficient data to answer the research question and meet the research objectives, is called content validity, while construct validity ensures that deductions can be made from the operationalised variables of the research to the theoretical constructs on which they are based (Yilmaz, 2013).

Saunders et al. (2009) refers to reliability as the extent to which data collection techniques yield consistent findings. Before the study began, a pilot study was conducted. Using the same survey technique planned for use in the study, the questionnaire was distributed to 10 ERP users within the researcher's own organization. Feedback from the six respondents was positive and no adjustments to the survey were necessary. The pre-test results were discarded and not included in the study.

Since the researchers were only interested in collecting data from ERP users who were employed by the organization at the time of the ERP implementation, the reliability of the data to be analysed was enhanced through the screening question discussed in an earlier section. Since the data was collected using a self-administered internet survey with anonymity guaranteed, the risk of participant bias should have been reduced. Furthermore, the use of a standardised questionnaire increased the reliability of the collected data.

The validity and reliability of collected data along with the response rates achieved, was largely dependent on the design of the questions and the structure of the questionnaire (Saunders et al. 2009). A common approach to assessing reliability is to check for internal consistency. Internal consistency measures the consistency of responses across other questions for the same construct on the same questionnaire. The most frequently used method to test for internal consistency reliability is Cronbach's alpha (Bonett & Wright, 2015; Saunders et al., 2009).

To measure the validity of the instruments, a bivariate Pearson's Correlation was run between each item-question and the item-total score using SPSS software. All correlations were significant ($p < 0.05$), thus confirming the validity of all questions. To

establish the internal consistency of questions measuring the same construct, Cronbach's Alpha tests were performed. The Cronbach's alpha scores for all items within all constructs were above 0.7, the generally accepted lower limit for Cronbach's alpha (Hair et al., 2014). These measurements confirmed construct reliability and the data was considered reliable to conduct a detailed analysis.

To reduce analytical complexity, factor scores were calculated to allow items to load as one factor per construct. The factor scores were calculated as the means of the items for each construct: user participation (factor 1), top management support (factor 2), individual impact (factor 3a), organizational impact (factor 3b) and project success (factor 3).

Given that the sample size exceeded 50 responses ($N$ = 102), the data was assumed to be approximately normally distributed. Hair et al. (2014) contend that larger sample sizes (more than 50 observations) reduce the negative effects of non-normality.

### 4.7 Data collection process

Data for this study was collected using a self-administered internet survey using the online survey platform, SurveyMonkey. According to Byrne (2016), the use of internet surveys has several benefits. These include high confidence levels that the correct person has responded, reduced time to complete data collection, automated data input and more cost-effective data collection. With anonymity guaranteed, respondents are more likely to provide honest responses to the questions posed in online questionnaire surveys. Disadvantages of internet surveys include lower response rates, being unable to prompt, probe or clarify questions for the respondent and potential technical challenges which include connectivity interruptions and a dependency on the online survey platform provider (Saunders & Lewis, 2012).

To secure as many responses as possible, the researcher secured cooperation and support from the management of each organisation whose employees participated in the study. This support took the form of a company representative distributing the hyperlink to the online questionnaire to all candidate respondents on behalf of the researcher. This support from company management legitimized the survey and promoted higher response rates; however, the researcher was aware that he needed to ensure that confidentiality and anonymity was clearly communicated to the respondents. This was

achieved by clarifying the intent and approach of the study in the introduction of the questionnaire and by not requesting names of respondents.

Deutskens, De Ruyter, Wetzels and Oosterveld (2004) propose that early follow-up reminders yield moderately better results than later follow-ups. Early follow-ups should be sent to respondents to capitalise on the fast turnaround of online surveys. Although the cost of sending out follow-up reminders for an online survey is negligible, it should be done with care. Repeat follow-ups have been shown to have diminishing returns, with the non-financial cost of annoying potential respondents without a corresponding increase in response rates. Since the researcher was dependent on management support for the distribution of the survey link, the number of reminders was limited to one follow-up. The company representatives who initially distributed the survey link sent a reminder e-mail two weeks after the initial correspondence went out.

### 4.8 Analysis approach

The researcher received responses from 204 ERP system users. Due to the screening question “Were you employed by this organization during the ERP implementation project?”, 73 responses were automatically discarded (respondents needed to have been employed by the company at the time of the ERP implementation project to participate in this research). A further 29 responses were discarded as they contained missing data values for many questions.

Listwise deletion was not adopted as the approach to deal with missing data, as the listwise method requires that only complete data records be used (Hair et al., 2014). Following the listwise method would have required that a further 23 responses be eliminated due to these responses each missing a single data value. Instead of deleting these responses, the mean of the respective questionnaire items was calculated and inserted to replace the missing data value. Once the data preparation was complete, 102 usable responses remained.

The statistical analysis was performed using the commercially available ‘off-the-shelf’ software package, SPSS. Despite the researcher having obtained statistical insights and experience using SPSS during the Analytical Tools and Techniques course in the first year of the MBA programme, the services of a statistician were employed to run the statistical tests.

## 5 REFERENCES


Adams, J. (2007). *Research methods for graduate business and social science students*. New Delhi: SAGE Publications

Akkermans, H., & van Helden, K. (2002). Vicious and virtuous cycles in ERP implementation: a case study of interrelations between critical success factors. *European Journal of Information Systems*, *11*(1), 35-46.

Amoako-Gyampah, K. (2007). Perceived usefulness, user involvement and behavioral intention: an empirical study of ERP implementation. *Computers in Human Behavior, 23(3), 1232-1248.*

Bonett, D. G., & Wright, T. A. (2015). Cronbach's alpha reliability: Interval estimation hypothesis testing, and sample size planning. *Journal of Organisational Behavior*, 36(1), 3-15.

Byrne, D. (2016). *Research design.* Los Angeles, CA: SAGE Publications.

Costa, C. J., Ferreira, E., Bento, F., & Aparicio, M. (2016). Enterprise resource planning adoption and satisfaction determinants. *Computers in Human Behavior*, *63*, 659-671.

Chen, J. V., Yen, D. C., Pornpriphet, W., & Widjaja, A. E. (2015). E-commerce web site loyalty: A cross cultural comparison. *Information Systems Frontiers*, *17*(6), 1283-1299.

Cummings, T. G., & Worley, C. G. (2015). *Organization development and change (10th ed.)*. Stamford, CT: Cengage Learning.

Davis, J. M., Kettinger, W. J., & Kunev, D. G. (2009). When users are IT experts too: the effects of joint IT competence and partnership on satisfaction with enterprise-level systems implementation. *European Journal of Information Systems*, *18*(1), 26-37.

Deutskens, E., De Ruyter, K., Wetzels, M., & Oosterveld, P. (2004). Response rate and response quality of internet-based surveys: An experimental study. *Marketing Letter*s, 15(1), 21-36.

Doll, W. J., & Torkzadeh, G. (1989). A discrepancy model of end-user computing involvement. Management Science, 35(10), 1151-1171.

Dong, L., Neufeld, D., & Higgins, C. (2009). Top management support of enterprise systems implementations. *Journal of Information Technology*, *24*(1), 55-80.

Dwivedi, Y. K., Wastell, D., Laumer, S., Henriksen, H. Z., Myers, M. D., Bunker, D., Elbana, A., Ravishankar, M. N., Srivastava, S. C. (2015). Research on information systems failures and successes: Status update and future directions. *Information Systems Frontiers*, *17*(1), 143-157.

Elbanna, A. (2013). Top management support in multiple-project environments: an in-practice view. *European Journal of Information Systems*, *22*(3), 278-294.

Gable, G. G., Sedera, D., & Chan, T. (2008). Re-conceptualizing information system success: The IS-impact measurement model. *Journal of the Association for Information Systems*, *9*(7), 377-408.

Ganly, D. (2016). The 10 Success Factors of Postmodern ERP. *Gartner Research*. Retrieved from https://www.gartner.com/doc/3424818/success-factors-postmodern-erp

Ghobakhloo, M., & Tang, S. H. (2015). Information system success among manufacturing SMEs: case of developing countries. *Information Technology for Development*, *21*(4), 573-600.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate data analysis (7th ed.).* Edinburgh Gate: Pearson.

He, J., & King, W. R. (2008). The role of user participation in information systems development: implications from a meta-analysis. *Journal of Management Information Systems*, *25*(1), 301-331.

Hiebl, M. R., Gärtner, B., & Duller, C. (2017). Chief financial officer (CFO) characteristics and ERP system adoption: an upper-echelons perspective. *Journal of Accounting & Organizational Change*, *13*(1), 85-111.

Hwang, Y. (2014). User experience and personal innovativeness: An empirical study on the Enterprise Resource Planning systems. *Computers in Human Behavior*, *34*, 227-234.

Kim, H. W., & Kankanhalli, A. (2009). Investigating user resistance to information systems implementation: A status quo bias perspective. *MIS quarterly*, 567-582.

Kulkarni, U. R., Robles-Flores, J. A., & Popovič, A. (2017). Business Intelligence Capability: The Effect of Top Management and the Mediating Roles of User Participation and Analytical Decision Making Orientation. *Journal of the Association for Information Systems*, *18*(7), 516.

Liu, G. H., Wang, E., & Chua, C. E. H. (2015). Leveraging social capital to obtain top management support in complex, cross-functional IT projects. *Journal of the Association for Information Systems*, *16*(8), 707.

Lee, J. C., Shiue, Y. C., & Chen, C. Y. (2016). Examining the impacts of organizational culture and top management support of knowledge sharing on the success of software process improvement. *Computers in Human Behavior*, *54*, 462-474.

Marble, R.P. (2003). A system implementation study: Management commitment to project management. Information & Management, 41(1), 111-123.

Morris, M. G., & Venkatesh, V. (2010). Job characteristics and job satisfaction: understanding the role of enterprise resource planning system implementation. *MIS Quarterly*, 34(1), 143-161.

Nwankpa, J., & Roumani, Y. (2014). Understanding the link between organizational learning capability and ERP system usage: An empirical examination. *Computers in Human Behavior*, *33*, 224-234.

Pankratz, O., & Basten, D. (2017). Opening the black box: Managers' perceptions of IS project success mechanisms. *Information & Management, 55, 381-395*.

Petter, S., DeLone, W., & McLean, E. R. (2013). Information systems success: The quest for the independent variables. *Journal of Management Information Systems*, *29*(4), 7-62.

Popovič, A., Hackney, R., Coelho, P. S., & Jaklič, J. (2014). How information-sharing values influence the use of information systems: An investigation in the business intelligence systems context. *The Journal of Strategic Information Systems*, *23*(4), 270-283.

Project Management Institute. (2016). Pulse of the Profession. *8th global project management survey.*

Ram, J., Corkindale, D., & Wu, M. L. (2013). Implementation critical success factors (CSFs) for ERP: Do they contribute to implementation success and post-implementation performance? *International Journal of Production Economics*, *144*(1), 157-174.

Rezvani, A., Khosravi, P., & Dong, L. (2017). Motivating users toward continued usage of information systems: Self-determination theory perspective. *Computers in Human Behavior*, *76*, 263-275.

Sabherwal, R., Jeyaraj, A., & Chowa, C. (2006). Information system success: Individual and organizational determinants. *Management Science*, *52*(12), 1849-1864.

Saunders, M., & Lewis, P. (2012). *Doing research in business and management.* Edinburgh Gate: Pearson.

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students*. 5th ed. Edinburgh Gate: Pearson.

Sharma, R., & Yetton, P. (2003). The contingent effects of management support and task interdependence on successful information systems implementation. *MIS Quarterly*, 27(4), 533-556.

Sharma, R., & Yetton, P. (2011). Top management support and IS implementation: further support for the moderating role of task interdependence. *European Journal of Information Systems*, *20*(6), 703-712.

Standish Group, (2014). The Standish Group chaos report. *Project Smart.*

*Statista.* (n.d.). Retrieved from https://www.statista.com/statistics/605888/worldwide-enterprise-resource-planning-market-forecast/

Sun, Y., Fang, Y., Lim, K. H., & Straub, D. (2012). User satisfaction with information technology service delivery: A social capital perspective. *Information Systems Research*, *23*(4), 1195-1211.

Wegner, T. (2016). *Applied business statistics: Methods and Excel-based applications.* 4th ed. Cape Town: Juta

Yilmaz, K. (2013). Comparison of quantitative and qualitative research traditions: Epistemological, theoretical, and methodological differences. *European Journal of Education*, *48*(2), 311-325.

Yoon, Y., Guimaraes, T., & O'Neal, Q. (1995). Exploring the factors associated with expert systems success. *MIS quarterly*, 83-106.

**APPENDICES**

**Appendix A: Questionnaire**

**Qualifying variables**

A. Were you employed by this organisation during the ERP implementation project?

B. Are you a user of the ERP (direct) or of the output of the ERP (indirect)?

**Section A**

Please indicate the applicable option using a tick symbol ( ☑ )

1. Gender: Male ☐
   Female ☐

2. Age: > 20 ☐
   21 to 29 ☐
   30 to 39 ☐
   40 to 49 ☐
   50 to 59 ☐
   60 < ☐

3. Position: Senior Manager ☐
   Middle Manager ☐
   Junior Manager ☐
   Professional ☐
   Administrator ☐

4. Highest qualification: Matric ☐
   Certificate ☐
   Diploma ☐
   Undergraduate degree ☐
   Honours degree ☐
   Masters degree ☐
   Doctorate ☐
   Other ☐

5. Years of service with current company:
   - Less than 1 year ☐
   - Between 1 and 5 years ☐
   - Between 5 and 10 years ☐
   - More than 10 years ☐

6. Years of experience with ERP systems:
   - Less than 1 year ☐
   - Between 1 and 5 years ☐
   - Between 5 and 10 years ☐
   - More than 10 years ☐

**Section B** (user involvement)

Using a five-point scale, please describe the amount of time you spent participating in the following ERP pre-implementation design activities.

Measurement scale

| | |
|---|---|
| 1 | Not at all |
| 2 | Once in a while |
| 3 | Sometimes |
| 4 | Fairly often |
| 5 | Frequently |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7. | Initiating the project | 1 | 2 | 3 | 4 | 5 |
| 8. | Establishing the project objectives | 1 | 2 | 3 | 4 | 5 |
| 9. | Determining end-user requirements | 1 | 2 | 3 | 4 | 5 |
| 10. | Assessing ways to meet end-user requirements | 1 | 2 | 3 | 4 | 5 |
| 11. | Identifying the sources of data/information | 1 | 2 | 3 | 4 | 5 |
| 12. | Defining the to-be business processes | 1 | 2 | 3 | 4 | 5 |
| 13. | Designing input forms/screens | 1 | 2 | 3 | 4 | 5 |
| 14. | Designing output reports | 1 | 2 | 3 | 4 | 5 |
| 15. | Determining the system access | 1 | 2 | 3 | 4 | 5 |

**Section C** (top management support)

Using a five-point scale ranging from (1) strongly disagree to (5) strongly agree, please evaluate top management support of the ERP.

Measurement scale

| | |
|---|---|
| 1 | Strongly disagree |
| 2 | Disagree |
| 3 | Neutral |
| 4 | Agree |
| 5 | Strongly Agree |

| | | | | | | |
|---|---|---|---|---|---|---|
| 16. | Top management in my organisation understand the potential benefits of the ERP. | 1 | 2 | 3 | 4 | 5 |
| 17. | Top management in my organisation encourage users to use the ERP. | 1 | 2 | 3 | 4 | 5 |
| 18. | Top management in my organisation provide the necessary resources for the ERP. | 1 | 2 | 3 | 4 | 5 |
| 19. | Top management in my organisation are interested in ERP end-user satisfaction. | 1 | 2 | 3 | 4 | 5 |

**Section D** (impact)

Using a five-point scale ranging from (1) strongly disagree to (5) strongly agree, please evaluate the individual impact and organisational impact the ERP has had.

Measurement scale

| | |
|---|---|
| 1 | Strongly disagree |
| 2 | Disagree |
| 3 | Neither agree nor disagree |
| 4 | Agree |
| 5 | Strongly agree |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Individual impact** is concerned with how the ERP has influenced your individual capabilities and effectiveness on behalf of the organisation. | | | | | | |
| 20. | I have learnt much through the presence of the ERP. | 1 | 2 | 3 | 4 | 5 |
| 21. | The ERP enhances my awareness and recall of job-related information. | 1 | 2 | 3 | 4 | 5 |
| 22. | The ERP enhances my effectiveness in my job. | 1 | 2 | 3 | 4 | 5 |
| 23. | The ERP increases my productivity. | 1 | 2 | 3 | 4 | 5 |
| **Organisational impact** refers to impacts of the ERP at an organisational level, specifically improved organisational results and capabilities. | | | | | | |
| 24. | The ERP is cost effective. | 1 | 2 | 3 | 4 | 5 |
| 25. | The ERP has resulted in reduced staff costs. | 1 | 2 | 3 | 4 | 5 |
| 26. | The ERP has resulted in cost reductions (e.g. inventory holding costs, administration expenses). | 1 | 2 | 3 | 4 | 5 |
| 27. | The ERP has resulted in overall productivity improvement. | 1 | 2 | 3 | 4 | 5 |
| 28. | The ERP has resulted in improved outcomes or outputs. | 1 | 2 | 3 | 4 | 5 |
| 29. | The ERP has resulted in an increased capacity to manage a growing volume of activity (e.g. transactions, volume/revenue growth). | 1 | 2 | 3 | 4 | 5 |
| 30. | The ERP has resulted in improved business processes. | 1 | 2 | 3 | 4 | 5 |
| 31. | The ERP has resulted in better positioning for business. | 1 | 2 | 3 | 4 | 5 |

## Appendix B: Ethical Clearance

Gordon Institute of Business Science
University of Pretoria

07 June 2018

Swanepoel Craig

Dear Craig

*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