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A South African institution perspective of a framework for enterprise resource planning systems

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Background: Public sector organisations encounter many challenges because of their complex legislative requirements, social responsibilities and higher public expectations. In the early 1980s, governments worldwide started experimenting with improving functions and processes through enterprise resource planning (ERP) systems.

Objective: This study investigated the feasibility of South African government institutions in adopting a guideline that will assist in implementing a sustainable ERP system to improve their information systems strategy.

Method: This study followed the qualitative dominating mixed research methodology. A survey was distributed to 20 participants with closed-ended questions to collect quantitative data and open-ended questions to collect qualitative data.

Results: Thirteen factors that allow ERP systems to be successfully implemented were identified. Some of the factors included effective change management policies, end-user specialised knowledge, organisation culture fit, top management support, ERP training before and post-implementation, visibility of activities throughout the workflow, and willingness to change. Sixteen issues that restrict ERP implementation were also identified. Some of the restricting factors include ERP system complexity, high levels of customisation, inadequate flexibility, budget, maintenance costs, lack of vendor support, implementation delays and cost overruns. The current state of ERP implementation in the investigated organisation is of acceptance with growth being achieved gradually and steadily.

Conclusion: The proposed framework provides core competencies such as top management support, ERP training before and post-implementation, and effective change management policies among others, that can be used to establish corrective measures before and during the installation of ERP systems.

Contribution: This study contributed to the body of knowledge by identifying the success and hindering factors of ERP system implementation. The proposed framework outlines guidelines for organisations to successfully adopt and implement ERP systems.

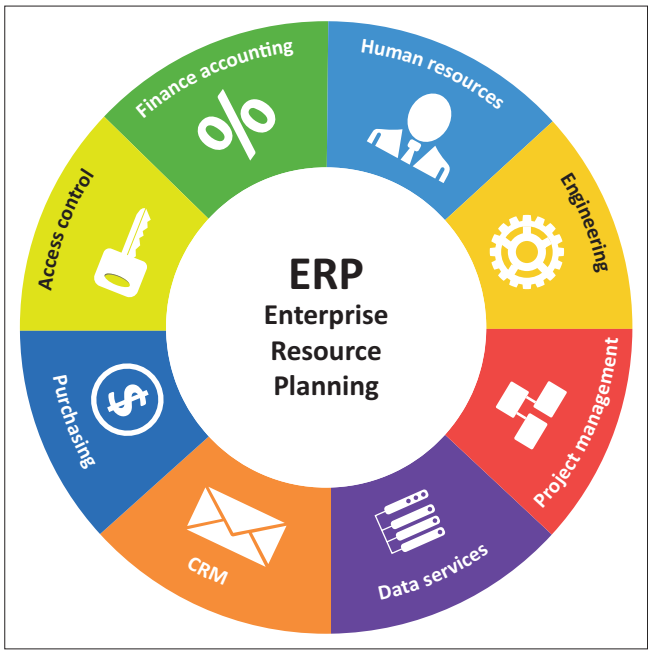
Keywords: government; enterprise resource planning (ERP); systems; deployment; business; implementation; benefits; challenges; critical success factors; organisation.

Introduction

Public sector organisations encounter many challenges because of their complex legislative requirements, social responsibilities and higher public expectations. In the early 1980s, governments across the world started to experiment with how they do things. One of the developments was improving functions and processes through enterprise resource planning (ERP) systems (Fernandez, Zainol & Ahmad 2017).

Enterprise resource planning systems are defined as a combined software package comprising a set of standard functional modules (production, human resources, sales and finances), integrated by a vendor, which can, in turn, be adapted to the specific needs of each customer (Botta-Genoulaz & Millet 2006). Figure 1 depicts the key modules that would typically be found in an ERP system.

The fundamental idea of ERP systems is to use information systems (IS) and technology to improve the ability of organisations to plan and integrate resources, such as production, design, sales, finance and procurement. The existing ERP application programmes can be traced back to



Source: Behance, 2016, Enterprise resource planning integration, viewed from https://www.behance.net/search/projects/?search=Enterprise%20Resource

ERP, enterprise resource planning; CRM, Customer relationship management.

FIGURE 1: Key enterprise resource planning modules.

the applications of material requirements planning (MRP). Currently, ERP systems comprise all integrated ISs that any organisation can use for its operations and decision-making. After being continuously developed for the past decade, ERP systems have become the backbone of today's business operations (Huang et al. 2019).

There are three current major international ERP vendors, namely SAP, ORACLE NET SUITE and MICROSOFT DYNAMICS 365 (Medicherla & Archana 2022; Sharma et al. 2020). Gartner (2022) identified the following four international leading cloud ERP application vendors:

- Oracle (Fusion Cloud ERP).
- Workday.
- SAP (S/4HANA).
- Oracle (NetSuite).

Organisations implement ERP systems for the following reasons (Botta-Genoulaz & Millet 2006; Medicherla & Archana 2022):

- One single source of data across the organisation.
- Improved productivity by the effective use of resources.
- Organisation's competitive advantage.

Even though ERP systems have been around since the early 1960s worldwide, there is a lack of its full adoption within the public sector domain in South Africa (Lechesa, Seymour & Schuler 2012; Nwankpa & Roumani 2014; Van Vuuren & Seymour 2013). According to Nwankpa and Roumani (2014), some institutions have adopted ERP systems. These systems are not being utilised to their full potential. A certain amount of work is still performed manually and some departments have implemented certain ERP modules while neglecting or misusing others. This, in turn, hinders the organisation's resources from delivering services promptly to the public and a waste of time executing manual functions that should be automated. In addition, it was observed that some institutions do not have the right experience and the required expertise in managing the deployment, maintenance and upgrades of ERP systems (Ng, Gable & Chan 2003).

According to Van Vuuren and Seymour (2013), the ERP systems adoption failures have been attributed in part to the poor fit between the ISs strategy and the organisational background. Despite 20 years of experience and research, ERP projects frequently go beyond their allocated budgets and timelines and fall short of stakeholders' expectations. Approximately 70% of ERP installations fail to produce projected advantages, and three-quarters of these projects fail (Janssens, Kusters & Martin 2020).

This article addresses the research problem of a lack of successful implementation and full adoption of ERP systems in government and other institutions in South Africa by answering the research question:

'What framework can improve the integration of a successful ERP system in a government institution?'

In answering the research question, these sub-research questions were investigated:

- What factors impede a fully integrated ERP system in government institutions?
- What is the current state of implementation in the organisation under study?
- What factors contribute to the successful implementation of ERP systems in government institutions?

Literature review

Enterprise resource planning systems are modules or applications that could provide a fundamental change in the way that the organisation does business. It is a mixture of applications, several business procedures and departments in a single database or data warehouse to present a holistic view of the business (Fernandez et al. 2017). Components of an ERP system comprise sub-application software, strategic management controls and operational controls, as well as all workers at each level of the organisational pyramid (Jafari & Zolfagharian 2019). Enterprise resource planning systems projects are not easy to implement. The implementation often involves high costs, resources as well as a considerable amount of time. The implementation of ERP projects is a critical event in the life of an organisation. When an ERP system is implemented, an organisation expects that there will be a significant positive transformation in the way processes are executed (Chatzoglou et al. 2016).

Factors that contribute to the successful implementation of enterprise resource planning systems in organisations

Shanks et al. (2000), in their article, describe 11 'critical success factors' and these include top management support; external expertise; balanced project team; data accuracy; clear goals; project management; change management education and training; the existence of a champion (there needs to be someone who regularly encourages the usage of the ERP system); minimal customisation; and full-time project team that will only focus on the implementation (Shanks et al. 2000).

Nofal and Yusof (2015) developed a proposed conceptual framework that acknowledged the most popular critical success factors for ERP successful implementations in small and medium organisations in Jordan. The factors identified were top management support, data quality and integrity, business process re-engineering (BPR), teamwork and composition, project management, clear vision and planning, effective communication, training and change management. The factors are discussed together with other factors identified by Saade and Nijher (2016) that also contribute to the successful implementation of ERP systems:

Top management support: According to a study conducted by Mahmood, Khan and Bokhari (2019), it is ranked as number one and deemed to be the most crucial aspect of ERP. Before gaining top management support, it is usually a good idea to outline the project's goals and objectives. It is nearly universally acknowledged that top management support is important to the success of information technology IT or IS projects (Saade & Nijher 2016).

Change management: Change management is ranked as one of the critical factors with highly cited frequency in the past research (Mahmood et al. 2019). The process of confronting challenges with adjustments that may impact the status quo in the organisation is known as resistance to change. In another research conducted by Selander and Henfridsson (2012), it was found that middle managers are the most resistant to ERP implementation.

Training and development: The ERP systems are intricate and necessitate specialised training. In most situations, providing ERP training to staff resulted in hidden expenditures for businesses. A lack of focus on employee training may be a problem. According to a 1996 study by Koch (1996) on ERP use, 30% – 40% of staff were unable to operate a new ERP system without sufficient training.

Effective communication: As ERP systems are cross-functional systems, effective communication and coordination among users from various departments participating in ERP implementation are critical. Employees should be informed of the objectives, scope, activities and changes that will be implemented for a successful ERP implementation (Mahmood et al. 2019).

System integration: The ERP system's potential benefits may be achieved if it is integrated with other business systems in the organisation. Enterprise resource planning acts as a foundation. During ERP deployment, one of the key difficulties that organisations face is system integration (Bingi, Sharma & Godla 1999). Mahmood et al. (2019) claim that no single application can fulfil all an organisation's requirements.

Business process re-engineering: The BPR is the rethinking and redesigning of business processes to improve organisational performance in terms of quality, cost, speed and service. Organisational willingness to alter business processes to meet the ERP software while limiting modification is necessary for a successful ERP installation. Because customisations must be re-coded every time ERP systems are upgraded, upgrading customised ERP systems has become costly and time-consuming (Mahmood et al. 2019).

Vendor selection: Vendor selection entails comparing and choosing partners for software, hardware, databases, networks and other services. Choosing the right product is vital for ERP deployment and many academics consider vendors and consultants to be a critical component in ERP system performance. It is ranked number seven in the study conducted by Mahmood et al. (2019). Enterprise resource planning vendor selection criteria are typically oriented on product characteristics rather than the satisfaction of relevant stakeholders.

Project management: Project management is concerned with initiating, planning, implementing and controlling various project operations to meet deadlines. According to Dezdar and Sulaiman (2009) study's frequency analysis of 95 journal articles, project management, ERP team composition, expertise and BPR are all essential elements in ERP deployment.

Project team formation: Studies conducted by Stratman and Roth (2002) and Saade and Nijher (2016) have identified project team members' competence as one of the critical success factors in ERP installation. Members of the project team should have the authority to make decisions that will improve the prospects of a successful ERP deployment (Mahmood et al. 2019).

Team empowerment: It refers to the ability of a group to make decisions based on their preferences rather than relying on top management's permission. Enterprise resource planning implementation necessitates team empowerment because it boosts confidence while also saving time, yet skilled personnel is required to make effective use of authority. Previous research has identified team empowerment and skilled individuals as critical factors in the effective implementation of ERP systems in businesses (Mahmood et al. 2019).

Organisational culture: Employees' beliefs, attitudes, actions and principles are reflected in organisational culture. The conclusion drawn from a review of previous research is that organisational culture has a substantial impact on ERP deployment success. A culture of learning and development, which includes shared beliefs, new ideas, transferrable skills and knowledge, is required for effective ERP adoption (Mahmood et al. 2019).

End-user perception: How end-users perceive the system plays an important role in achieving success with ERP systems. It also dictates how utilisation will take place, thereby reaping the potential benefits that the system can offer. A study conducted by Asli Yagmur and Jaideep (2005) identified a need for management to recognise the perceptions of the end-users and the areas that yielded satisfaction or dissatisfaction with ERP systems.

Theoretical foundation

The technology-organisation-environment framework (TOE) theoretical model was appropriate for this study. This theoretical framework was used as a basis for the choices concerning the research methods. Furthermore, the framework stipulated the crucial variables that impacted the phenomenon of interest. The framework denotes how the organisational setting guides the adoption and implementation of innovations. The TOE framework is a theory that states that three elements of an organisation's environment influence innovation adoption and implementation decisions (Baker 2012).

Methodology

The process through which researchers must perform their research is known as a research methodology. It demonstrates the process by which these researchers define their problem and objective and then provide their findings based on the information gathered over the study period. The goal of the research design is to offer a suitable framework for a study. The decision to be made regarding the research approach is crucial to the research design process because it defines how relevant data for a study will be gathered (Sileyew 2019). The study followed the qualitative dominating (QAUL+quan) mixed research methodology depicted in Figure 2. To collect data in this study, the researcher employed the survey research strategy and distributed a survey with closed-ended questions to collect quantitative data and open-ended questions to collect qualitative data in the same survey using the following data generation techniques (Johnson, Onwuegbuzie & Turner 2007):

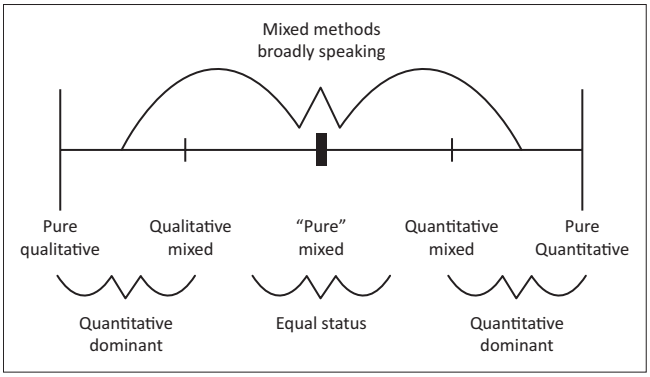
- The researcher distributed questionnaires as an email attachment to the participants (Oates 2005).
- The researcher used statement-answer format questions.
- The researcher used the Likert scale format questions (five-point scale) – these were divided into three categories taken from the TOE Framework: Organisational Setting, Environmental Setting and Technological Setting.

The questionnaires were self-administered, that is, the participants completed the questions in the absence of the researcher. The survey questionnaire was sent by email to 50 participants and 20 participants responded. As a result, 20 survey samples were collected. The primary data collected from the fieldwork was used for the data analysis.

The philosophy followed for this research is the interpretive philosophy. The researchers interacted with the phenomenon, deliberated on the phenomenon, and analysed their findings, which is inherent in the interpretive philosophy (Sahay 2016). This has enabled the researcher to gain an understanding of the factors that are contributing to the successful adoption of a fully integrated ERP system at a South African government institution. It also enabled the researcher to identify those factors that are contributing to the current problem where ERP systems are not fully integrated. Inductive reasoning was used in this research study as the researcher first gathered data and then analysed the data to establish a conclusion (Melnikovas 2018).

The study combined the TOE process model framework and a set of critical success factors from the literature to develop the survey questions. The theoretical framework limited the scope of the data gathered as it focused on specific variables and viewpoints used in the analysis and interpretation of the collected data. In addition, the framework assisted in understanding the concepts as defined, thus challenging and validating the theoretical assumptions to build knowledge (Baker 2012).

In this study, the population refers to all entities involved in the planning, implementation, testing, support, and users of ERP systems in the organisation under study. The population was homogenous as it did not matter whatever socioeconomic, gender or religious group the employees belonged to (Alvi 2016). This study used the probability sampling technique as the purpose was to develop an understanding of the population. This was also dependent on the availability of factors such as time and costs and the efforts of conducting the sampling. The targeted population was only workers who



Source: Johnson, R.B., Onwuegbuzie, A.J. & Turner, L.A., 2007, 'Toward a definition of mixed methods research', *Journal of Mixed Methods Research* 1(2), 112–133. https://doi.org/10.1177/1558689806298224

FIGURE 2: Three major research paradigms, including subtypes of mixed research method.

work in the organisation under study; therefore, the researcher used simple random sampling as the population is homogenous and a comprehensive list could be readily prepared (Alvi 2016).

The size of the sample was limited to 30 participants with a target population of 35 to generate a confidence level percentage of 95 with an accuracy level of ± 3%. The researcher understood that the sample size could not be less than 30 participants to use statistical analysis (Oates 2005). Therefore, the qualitative analysis was simply performed to compare phenomena. The researcher only managed to secure 20 participants which was considered to be sufficient. Based on the research carried out by Guest, Bunce and Johnson (2006), data saturation had occurred for the most part around the time they had examined 12 interviews. They generated 92% of the overall number of codes developed after 12 interviews. Their findings also revealed that after analysing 12 interviews, new themes arose infrequently and gradually as the study progressed (Guest et al. 2006). Data were collected from individuals with the necessary knowledge and experience in the identified institution. The participants in the study included management, business analysts, test analysts and all other stakeholders involved in the planning and implementation of the ERP systems in the organisation. The data collected comprised the general background information of the organisation, the current state of ERP system implementation, challenges faced with ERP system usage in the organisation, the current ERP implementation process model and what the organisation considers as critical success factors in the implementation of ERP systems.

For the quantitative data analysis, the Likert scale questions from the questionnaire were transcribed to Microsoft Excel and then formatted and prepared for analysis. Analysis was performed by calculating how the respondents responded to the 5 Likert scale questions (Agree, Disagree, Neither Agree nor Disagree, Strongly Agree and Strongly Disagree). Thematic analysis was the methodology used for the data analysis of the open-ended questions. Thematic analysis is a qualitative data analysis technique for locating, analysing and interpreting meaning patterns ('themes'). As an analysis tool for this study, Atlas.ti was used to manage, analyse and code the qualitative data. A total of 103 initial codes were generated. Generating codes resulted in searching for emerging themes. Themes were discovered, defined and named during the coding process and were further reviewed and refined. The emerging themes from the survey are presented in Table 1.

Ethical considerations

Ethical clearance to conduct this study was obtained from the Faculty of Economic and Management Sciences Research Ethics Committee at the University of Pretoria. The ethics approval number is (Ref EMS230/21).

TABLE 1: Final codes with associated themes.

Number	Code	Theme
1	All modules are beinq used	The current state of implementation
2	Budget	Factors that can impede or restrict a fully integrated ERP system
3	Business complexity	Factors that can impede or restrict a fully integrated ERP system
4	Effective change management policies	Factors contributing to the successful implementation or adoption of ERP systems
5	Contracting necessary	Factors contributing to the successful implementation or adoption of ERP systems
6	Implementation delays and cost overruns	Factors that can impede or restrict a fully integrated ERP system
7	Follow ERP implementation guidelines from the vendor	Framework or guidelines to improve the integration of a successful ERP system
8	Ease of use and maintenance	Factors contributing to the successful implementation or adoption of ERP systems
9	integration of systems and functions across the organisation to provide one central view of data	Factors contributing to the successful implementation or adoption of ERP systems
10	End-user involvement	Factors contributing to the successful implementation or adoption of ERP systems
11	End-user specialised knowledge	Factors contributing to the successful implementation or adoption of ERP systems
12	ERP adoption is rapid	The current state of implementation
13	ERP implementation meets organisational requirements	Factors contributing to the successful implementation or adoption of ERP systems
14	Size of the project not taken into account during planning	Factors that can impede or restrict a fully integrated ERP system
15	Stable and gradual growth	The current state of implementation
16	Strategic intent nol clearly articulated	Factors that can impede or restrict a fully integrated ERP system
17	Organisational structure	Factors that can impede or restrict a fully integrated ERP system
18	Unrealistic timelines for implementation	Factors that can impede or restrict a fully integrated ERP system
19	Top management support	Factors contributing to the successful implementation or adoption of ERP systems
20	ERP training before and post-implementation	Factors contributing to the successful implementation or adoption of ERP systems
21	ERP System complexity	Factors that can impede or restrict a fully integrated ERP system
22	ERP system is adopted	The current state of implementation
23	ERP system is functional	The current state of implementation
24	Features are not adequate for the organisation's needs	The current state of implementation
25	Fit the culture of the organisation	Factors contributing to the successful implementation or adoption of ERP systems
26	Framework be built and adopted	Framework or guidelines to improve the integration of a successful ERP system
27	Selecting the right ERP solution	Factors that can impede or restrict a fully integrated ERP system
28	Govamanca processes	Framework or guidelines to improve the integration of a successful ERP system
29	Guided by industrywide principles of implementing	Framework or guidelines to improve the integration of a successful ERP
30	Guidelines from gartner	Framework or guidelines to improve the integration of a successful ERP system
31	High adoption rate	The current state of implementation
32	High levels of cusatomisations	Factors that can impede or restrict a fuliv intearated erp system
33	Implementation of ERP modules that are not necessary	Factors that can impede or restrict a fully integrated ERP system
34	Willingness to change	Factors contributing to the successful implementation or adoption of ERP systems
35	Resistance to change	Factors that can impede or restrict a fully integrated ERP system
36	Implementation took long	The current state of implementation
37	Inadequate flexibility	Factors that can impede or restrict a fully integrated ERP system
38	Inept following of SDLC	Factors contributing to the successful implementation or adoption of ERP systems

Table 1 continues on the next page →

TABLE 1 (Continues...): Final codes with associated themes.

Number	Code	Theme
39	Internal technical resources availability	Factors contributing to the successful implementation or adoption of ERP systems
40	Lack of adoption from users due to preferences from organisation	The current state of implementation
41	Unsure of the current state of implementation	The current state of implementation
42	User requirements delayed implementation	Current state of implementation
43	Visibility of activities on all stages of the workflow	Factors contributing to the successful implementation or adoption of ERP systems
44	Modules available in ERP implemented outside the ERP system	The current state of implementation
45	No clear expectations and matrices to evaluate success or failure	Factors that can impede or restrict a fully integrated ERP system
46	Not implementing best-recommended practices	Factors that can impede or restrict a fully integrated ERP system
47	Not properly vetting vendors	Factors that can impede or restrict a fully integrated ERP system
48	ERP system needs enhancement	The current state of implementation
49	Proper planning of the project another organisation	Factors contributing to the successful implementation or adoption of ERP systems
50	Lack of col laboralion	Factors that can impede or restrict a fully integrated ERP system
51	Lack of support from the vendor	Factors that can impede or restrict a fully integrated ERP system
52	Maintenance costs	Factors that can impede or restrict a fully integrated ERP system
53	System maturity score is good	The current state of implementation
54	Passes quality gates	Factors contributing to the successful implementation or adoption of ERP systems
55	People's adoption of the system	Factors contributing to the successful implementation or adoption of ERP systems
56	The platform is well supported	The current state of implementation
57	Poorly planned projects	Factors that can impede or restrict a fully integrated ERP system

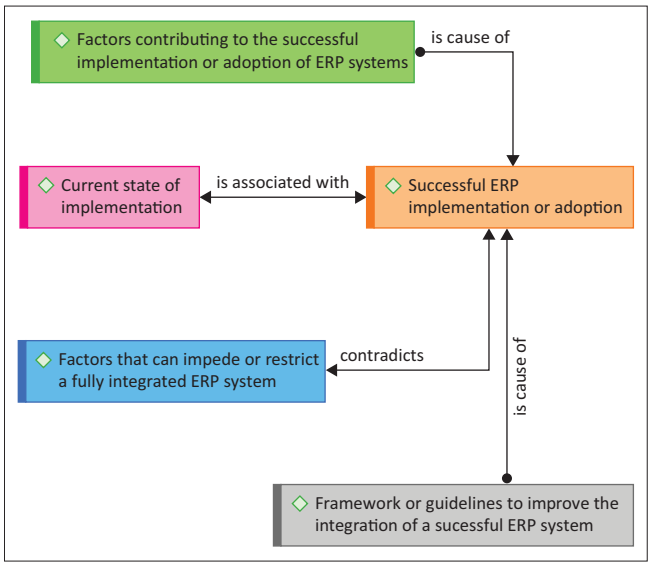
ERP, enterprise resource planning.

Results

The data were examined using Clarke and Braun (2014) methodology. Out of 103 initial codes, a total of 57 codes were chosen after constant comparison and merging of comparable codes and the rejection of several codes that were thought to be unnecessary to the study's goal. Table 1 lists the selected codes and the themes that resulted from them. The final thematic map is depicted in Figure 3. The responses to the open-ended questions from the participants are reflected in Appendix 1. Responses from the close-ended (Likert scale questions) are reflected in the form of graphs or charts in Appendices 2–4. Appendix 5 reflects the word cruncher of the words contained in the participants' responses, generated from Atlas.ti.

During the thematic analysis, the following four main themes were discovered:

- The current state of implementation.
- Factors that can impede or restrict a fully integrated ERP system.
- Factors contributing to the successful implementation or adoption of ERP systems.



ERP, enterprise resource planning.

FIGURE 3: Final thematic map.

- Framework or guidelines to improve the integration of a successful ERP system.

The four themes are discussed next.

The current state of adoption

There was widespread consensus that the ERP system in the organisation under investigation had not been properly adopted. On the other hand, some individuals thought the present adoption was good. The majority of the participants, however, did not share this opinion. The following factors depicted in Figure 4 have been identified in terms of adoption.

The participants explained the present state of implementation in the organisation under study. Fifty per cent of the participants agreed that implementation projects are managed effectively and are easy to use. Refer to Appendix 4.

Factors that can impede or restrict a fully integrated enterprise resource planning system

Participants highlighted the characteristics in Figure 5 as significant obstacles to a fully integrated ERP system.

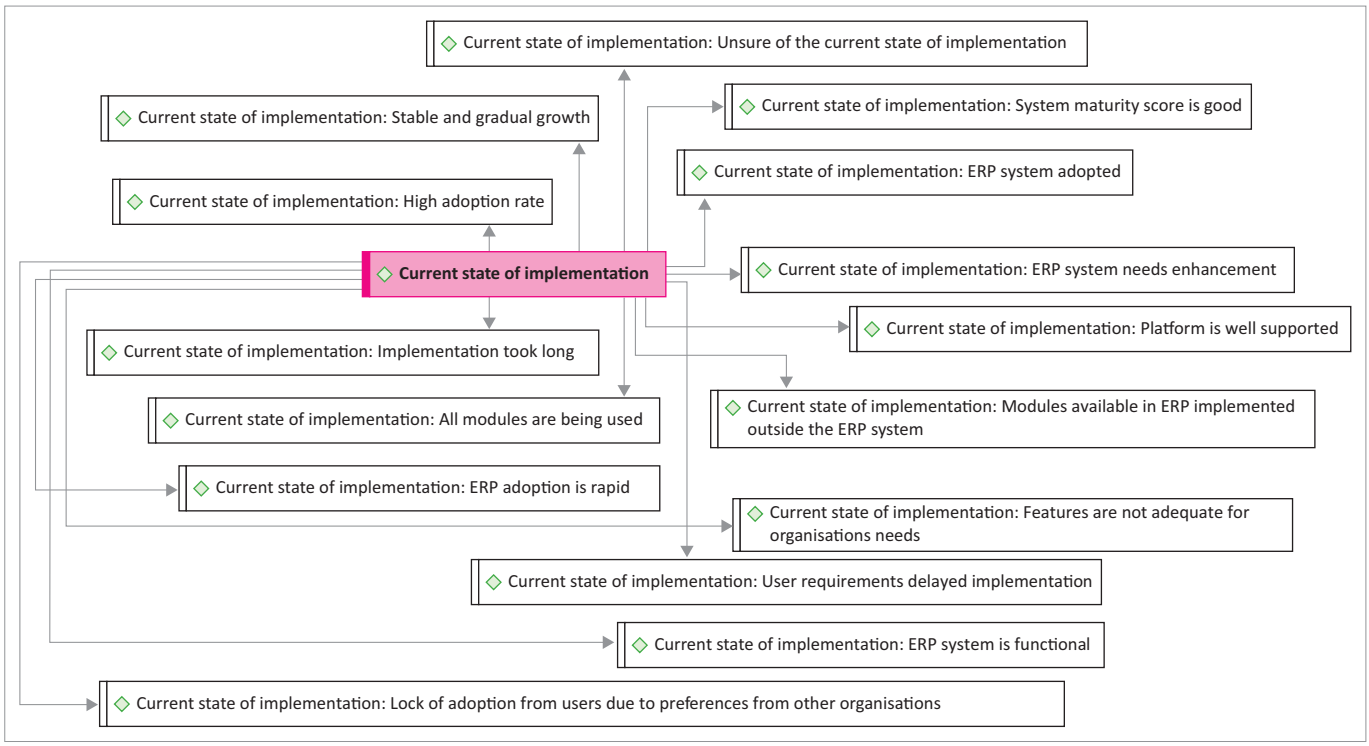
Factors contributing to the successful implementation or adoption of enterprise resource planning systems

Participants highlighted the characteristics in Figure 6 as significant factors contributing to a successful and fully integrated ERP system.

Framework or guidelines to improve the integration of a successful enterprise resource planning system

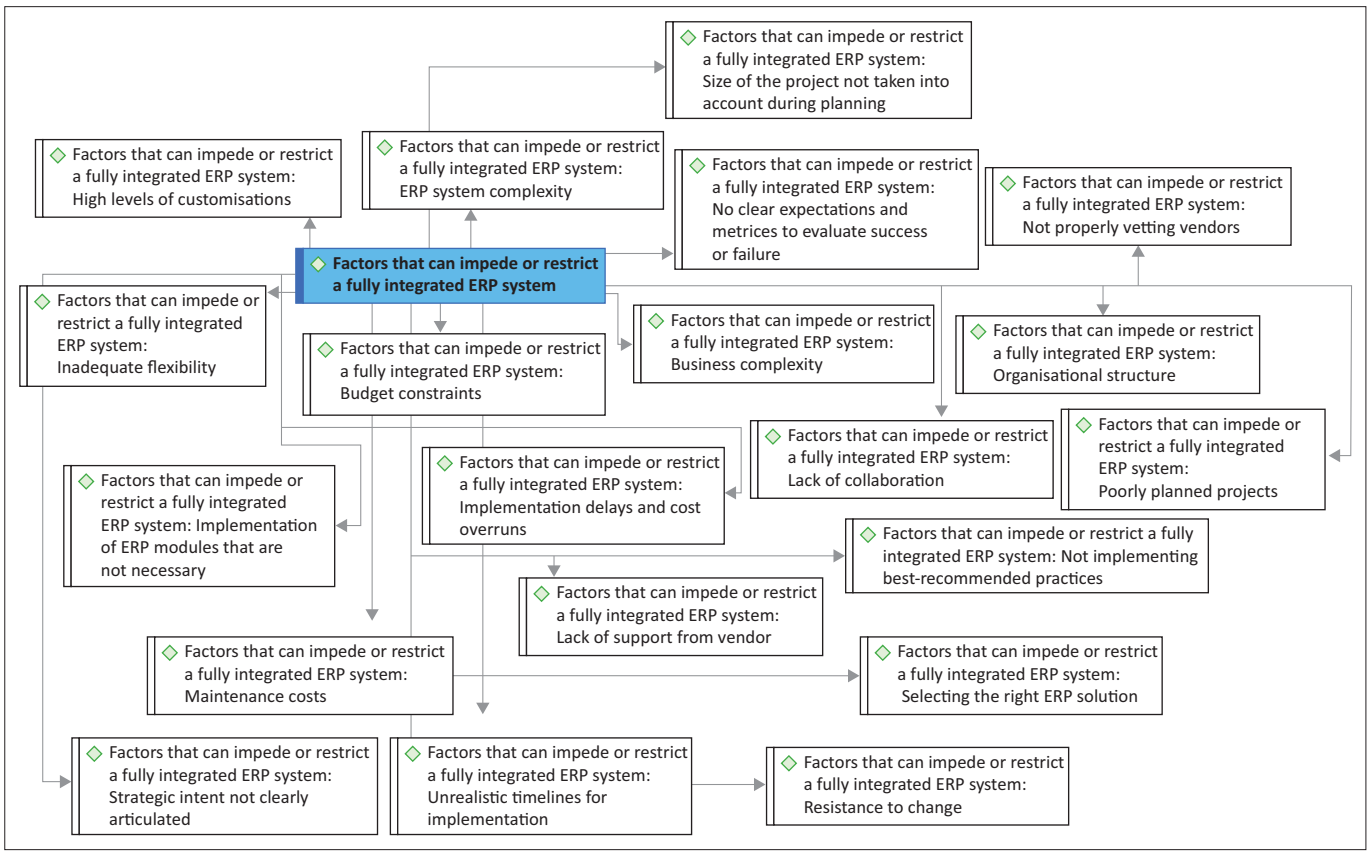
Participants highlighted the following characteristics as possible guidelines that can contribute to achieving a fully integrated ERP system:

- Follow implementation guidelines from the vendor.
- Guided by industry-wide principles for implementing solutions.
- A framework is built and adopted.



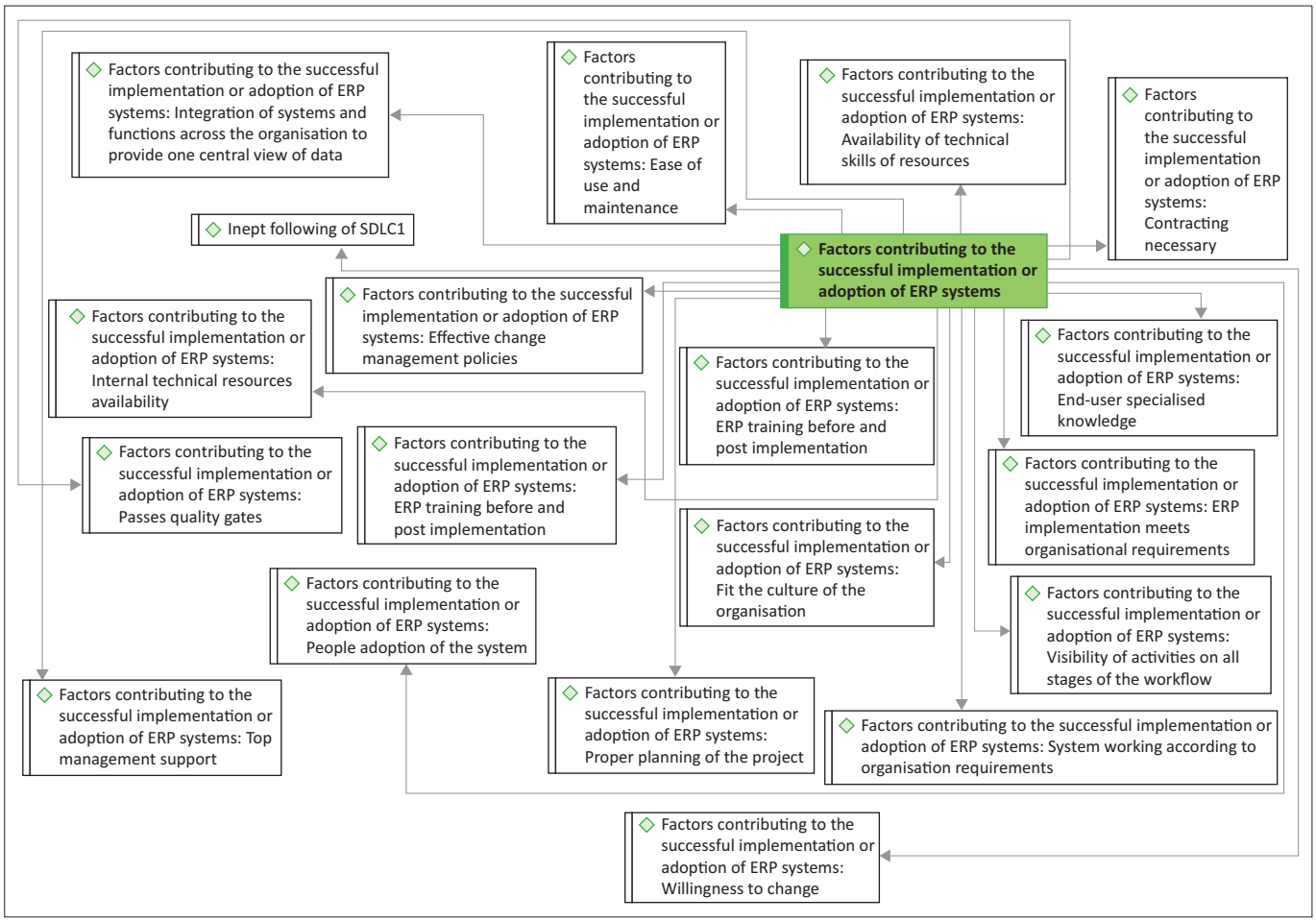
ERP, enterprise resource planning.

FIGURE 4: The current state of implementation.



ERP, enterprise resource planning.

FIGURE 5: Factors that can impede or restrict a fully integrated enterprise resource planning.



ERP, enterprise resource planning.

FIGURE 6: Factors contributing to the successful implementation or adoption of enterprise resource planning systems.

- Guidelines from Gartner.
- Governance processes.

Discussion

The sub-research questions are discussed to answer the main research question.

Discussion of key findings

What are some of the factors that can impede or restrict a fully integrated enterprise resource planning system in government institutions?

The following variables were identified as significant in restricting a fully integrated system by the findings of this study from the fieldwork. Each variable is discussed.

Enterprise resource planning system complexity: A participant in the survey stated that some ERPs are too complicated for end-users to use in their day-to-day operations. The literature suggests that the problem may not be with the system's complexity but rather with the users' lack of ability to operate the ERP system. According to the literature, ERP system challenges can be caused by various internal issues. A lack of ERP system users' skills is one of them. Users may lack the knowledge needed to standardise modules to correspond with business procedures. The literature shows how the end-users perceive the system will play a significant role in realising success with ERP systems. Perception also dictates how utilisation will happen, thereby reaping the system's potential. In their study, Asli Yagmur and Jaideep (2005) observed that when management is sensitive to the factors that yield satisfaction or dissatisfaction, they can easily develop and employ proper strategies that are critical in improving end-user satisfaction with the system. Areas that are likely to provide resistance can be identified earlier in the process, allowing the organisation to put controls and specific actions in place to mitigate this resistance issue and instead increase the acceptance rate of the new ERP system (Asli Yagmur & Jaideep 2005).

High levels of customisation: A participant in the survey mentioned this factor. This is supported by literature as Desta (2016) indicated that a significant issue with ERP system implementations is that they require extensive customisation and knowledgeable resources to perform the tasks. Another participant also supported this statement by identifying customisation as one of the delaying factors in implementation. This was further reinforced by the literature, which claimed that ERP customisation might result in higher installation costs and longer timelines, thereby tying up resources that could otherwise be used for other purposes in the organisation, as Soliman and Karia (2017) stated. These

literature findings are consistent with other literature findings. It has also been indicated that a high level of customisation in a fast-changing environment negatively influences cost savings and the perceived benefit of ERP SaaS (Software as a Service) technology (Lechesa et al. 2012).

Inadequate flexibility: Inadequate flexibility was identified in the literature as a restricting factor. Participants believed that ERP systems require flexibility, which affects adoption (Lechesa et al. 2012). This is supported by the field study where participants mentioned that if the ERP system is not flexible to allow changes, then the organisation may need to change its processes to suit the system.

Budget: Some participants mentioned size and budget as some of the restricting factors that impede adoption (see the response to question two by participant 8 in Appendix 1). Other authors in the literature support this observation. Marikar, Ahamed and Musthafa (2020) stated that many ERP systems implementations fail because they usually exceed the time allocated for the project and the budget.

Maintenance costs: Participants in the field study indicated that regular maintenance is imperative in ERP systems, thereby impacting the costs allocated to the project. They indicated that these systems might start as less expensive; however, costs will increase because of the required maintenance. These maintenance costs need to be factored in at the beginning of the project for the organisation to avoid paying large sums of money over time. The literature supports this stance as other scholars have indicated that some organisations do not have the necessary experience in managing the deployment and maintenance of ERP systems (Ng et al. 2003). In addition, other scholars agreed that ERP systems are associated with substantial implementation and maintenance costs (Lechesa et al. 2012).

Strategic intent not clearly articulated: According to some of the participants in this field of study, not enunciating the strategic intent of the implementation with clear expectations and metrics to evaluate success or failure contribute to unsuccessful ERP implementations Scholars support the literature that a clear strategic direction is imperative in successfully implementing ERP systems throughout the ERP project life cycle (Mahmood et al. 2019). This was further supported by other scholars who mentioned this factor as crucial in successful implementations (Saade & Nijher 2016).

A lack of support from the vendor: Vendor support was identified as one of the essential variables that appeared to be constant as enabling factors for effective installations of ERP systems across industries and geographic regions. As a result, it can be deduced that a lack of vendor support will sabotage a successful implementation (Saade & Nijher 2016).

Implementation delays and cost overruns: A participant in the field study stated that poorly planned projects result in delays and cost overruns. This is supported by literature as Desta (2016) suggested that when management does not consider the extensive customisation and resource skills required in ERP implementations, this can delay the project and cause cost overruns.

A lack of collaboration: Participants stated that ERP system implementation and adoption failed because of a lack of collaboration among different team members. The literature supports this as it has been observed by Malaurent and Avison (2015) that a successful implementation also requires collaboration between researchers and practitioners to make improvements to practice rather than merely watching and reporting to management. Mahmood et al. (2019) also stressed the value of collaboration between vendors and consumers in successfully installing such a system in organisations.

The size of the project was not considered during the planning: Size and budget were noticed by some participants as constraints that could obstruct a fully integrated ERP system. Marikar et al. (2020) stated that the reason many ERP system implementations fail is that they usually exceed the time allocated for the project as well as the budget. On the other hand, slack and size are two of the most regularly recognised elements in the organisation that affect innovation, according to the literature (Baker 2012).

Not properly vetting vendors: Participants stated that an organisation must thoroughly vet its vendors to avoid additional and unnecessary maintenance costs down the road. Vendors and consultants are a significant component in ERP system success, according to numerous academics and are ranked #7 in one study conducted. When shortlisting ERP vendors, variables such as the vendor's financial viability, diligence and other variables must be considered. Panorama Consulting, a provider of ERP systems and business software, claims that 50% of participants were dissatisfied with their ERP vendor. Therefore, selecting ERP and vetting the vendors is critical to successfully implementing such a system in organisations (Mahmood et al. 2019).

Organisational structure: In their studies, Zhu, Kraemer and Xu (2003) and Chuang, Nakatani and Zhou (2009) argued that organic, decentralised organisational systems are associated with adoption. These organisations place quality on collaboration, provide some flexibility in employee duties and encourage cross-communication in addition to the traditional reporting lines. While distributed structures could be best appropriate for the innovation phase of the process, power-driven structures may be better appropriate for the implementation phase, with more importance placed on formal reporting relations and consolidated decision-making processes (Zhu et al. 2003; Chuang et al. 2009). Communication methods can promote or stifle innovation within an organisation's framework (Baker 2012). In the field survey, only 25% of the participants believed that the organisational structure and culture promote new ways of working, such as ERP systems, for a more efficient working style.

Poorly planned projects: Poorly planned projects were mentioned in the field survey as a risk that can inhibit ERP deployment and cause delays and cost overruns. Only half of the participants agreed that ERP implementation projects are well-managed and straightforward. In the literature, research was carried out in Jordan by Janssens et al. (2020) to explore project management factors influencing ERP system deployment. A successful ERP implementation relies heavily on project management, and weak project management skills are frequently blamed for failed implementations. Therefore, having a capable project manager is essential for any ERP project, as is strong communication, which fosters employee trust and provides the information required for a successful ERP deployment. Furthermore, a well-prepared and qualified team will undoubtedly assist their manager in completing the project successfully; this can be accomplished by clearly defining roles and responsibilities for them to understand their assignments and providing them with the required training to improve their capabilities and knowledge level (Janssens et al. 2020).

Selecting the right enterprise resource planning solution: Because different vendors give various solutions in the market, case studies conducted in 2001 by Somers and Nelson (2001) and in 2003 by Soh et al. (2003) focused on selecting an appropriate ERP package as one of the important success elements for successfully installing an ERP system. Participants in the field study concurred with the literature as they mentioned that selecting the right ERP solution is crucial. Potential ERP users should be included in the selection of ERP packages for the company, according to previous research findings (Saade & Nijher 2016).

What is the current state of implementation in the organisation under study?

Most developing countries embrace e-government platforms, such as ERP systems and other IT solutions. While emerging countries can transcend technological generations, developing countries cannot. Technical systems are typically developed alongside institutional development in developed countries, allowing them to advance at all levels to gain a competitive advantage (Bakunzibake, Grönlund & Klein 2016).

Participants in the field study described the current state of implementation in the research organisation. The following are some of the more positive explanations for the current adoption or implementation state:

- The ERP system is adopted.
- Gradual and stable growth.
- High adoption rate.
- The platform is well supported.
- The organisation and system maturity score is good.
- All modules are being used.

On the other hand, some participants offered different justifications, implying that the organisation's current adoption status is not excellent. A few of the explanations are listed here:

- The ERP system needs enhancement.
- Modules part of the ERP solution are implemented independently of the system.
- Implementation was delayed because of missing requirements.
- The lack of adoption from users because of a preference of other organisations.

What factors contribute to the successful implementation or adoption of enterprise resource planning systems in government institutions?

According to the conclusions of this study from the fieldwork, the following variables are essential in enabling the successful implementation of a fully integrated system:

Effective change management policies: Only 35% of the participants agreed that there are effective change management policies in the organisation. From the start of ERP implementations, change management measures must be prioritised (Mahmood et al. 2019). The results of this study are consistent with other studies that have demonstrated that corporate transformation requires a well-defined organisational vision of the future and a practical change management approach to balance forces in favour of transformation against those opposed to change (Asli Yagmur & Jaideep 2005).

Cost and ease of maintenance: Some participants mentioned cost and ease of maintenance as factors that encourage the adoption of ERP systems. According to the literature, a well-designed and well-connected ERP system improves information sharing among company units, resulting in cost savings and increased efficiency and competitive advantages (Deshmukh & Kumar 2016). These findings align with previous studies' findings, which claim that an ERP system can provide various benefits to an organisation. Among these advantages are cost reductions (Jafari & Zolfagharian 2019). However, participants in other research believe that ERP systems require flexibility, which impacts cost. As a result, the subject of SaaS cost reduction cannot be evaluated in isolation (Lechesa et al. 2012).

End-user specialised knowledge: According to participants, ERP system adoption and deployment necessitates specialised knowledge for the system users. The field survey results indicated conflicting views about whether the organisation has the specialised knowledge and digital skill expertise to operate these efficiently and successfully. Only 35% of respondents agreed that the organisation has the essential expertise to carry out its technological responsibilities, refer to Appendix 2. A well-prepared and qualified team will undoubtedly assist the manager in completing the project successfully (Janssens et al. 2020).

Enterprise resource planning implementation meets organisational requirements: Participants in the survey mentioned that customisation and user requirements were some of the delaying factors in the successful implementation of ERP systems. It can then be concluded that the correct

requirements that meet the organisational needs translate to success. Researchers have suggested that the customisable limit may need to be adjusted as much as possible towards the client's unique requirements to suit clients' requirements (Lechesa et al. 2012). Furthermore, when the organisation's needs change over time, it is feasible that other manufacturers' modules will be purchased (Mahmood et al. 2019).

Fit the culture of the organisation: Participants in the field survey cited organisational culture as a critical factor in ERP system adoption. Fifty per cent of respondents agreed that people in the organisations have the same working culture. However, only 10% of the participants strongly agreed. Furthermore, 50% of the participants felt that the way people conduct things in the organisation is influenced by culture. Many people agree with this, with 35% strongly agreeing and the rest saying they do not know. In other prior studies, organisational culture contributed to a positive interaction between ERP staff and vendors, which aided ERP deployment success. Enterprise resource planning adoption requires a learning and development culture that comprises shared ideals, new ideas, transferable skills and knowledge (Mahmood et al. 2019). The findings of this study suggest that organisational culture is critical during the implementation of ERP systems and that senior management must ensure that the right culture is fostered to encourage ERP implementations.

Top management support: Participants expressed top management support as one of the critical success factors for ERP system deployment. According to the survey results, senior management support for implementing ERP systems to manage the organisation's operations is 80% or higher. If senior management is unavailable to enforce their staff policies and the project's employees do not commit, the project may be terminated. Chatzoglou et al. (2016) also indicated that a solid top management commitment and presence are critical, including substantial organisational changes.

Enterprise resource planning training before and post-implementation: Participants mention the ease of use and training as critical factors contributing to the successful implementation of ERP systems. Sixty-five per cent of the participants agreed that there is a solid commitment to the training and development of people when new ERP systems are introduced in the organisation. In the literature, training is one of the factors that have been identified by Shanks et al. (2000) as critical in the successful adoption of ERP systems. Another work carried out by Janssens et al. (2020) also emphasised that training is necessary to improve system users' capabilities and knowledge levels and technical resources. Enterprise resource planning systems demand continuous training, and organisations should allow employees to increase their ability to adapt to change (Mahmood et al. 2019).

Visibility of activities at all stages of the workflow: Participants in the field survey stated a need to combine organisational processes and various systems into a single platform where transactions may be executed end-to-end with visibility at all stages. Sixty per cent of the participants agreed that mechanisms are in place to assist the organisation in managing new ERP systems from development to deployment. The organisation also engages in effective re-engineering of business processes, according to 50% of respondents. However, more than half of the participants were doubtful whether the organisation's change management practices were effective. Integration was cited as an essential element when dealing with ERP system implementations. Enterprise resource planning systems may comprise multiple modules to meet organisational needs for the seamless running of business processes at the department and enterprise levels. If the ERP system relates to other business systems, the ERP system's potential benefits may be realised (Mahmood et al. 2019).

Willingness to change (people's adoption of the system): More than one participant in the survey cited a willingness to change and adopt new ways of working as an essential factor in implementing and successfully adopting ERP systems. Researchers have indicated that for the organisation to take full advantage of implementing ERP systems, the management should cultivate user adaptation to the system. This can be performed by customising business processes to support the existing functions and adjusting business processes to align with the best practices of ERP systems to make the system more user friendly and familiar to the users. Once the system users are comfortable with the system, it will make the people's adoption of the system easier. The system's end-user perception is critical to the ERP system's performance. It also specifies how the system will be used, allowing the technology's potential benefits to be realised. According to a 2018 study, management needs to understand end-user perspectives and the areas that result in satisfaction or discontent with ERP systems (Asli Yagmur & Jaideep 2005).

Internal technical resources availability: A participant in the field study mentioned the availability of internal technical skilled resources as critical in implementing ERP systems. The ERP demands individuals with specific skills; therefore, a shortage of skilled technical personnel may be an issue. People with a low degree of expertise focus on the essential tasks of ERP and neglect to use the system's complex capabilities. Most importantly, there will be a substantial knowledge gap if a key ERP person departs the organisation. Therefore, businesses must focus on personnel development and training to properly execute and sustain such initiatives (Mahmood et al. 2019).

Passes quality gates: A study conducted in Pakistan on socio-technical factors impacting successful ERP identified 13 factors that are critical to the success of these projects, quality management was among the factors (Saade & Nijher 2016). According to the findings of this study, quality management is critical during the implementation of ERP systems. High-quality systems can help to assure effective

adoption by lowering expenses incurred when a system fails to function as intended and must be repaired and users should be encouraged to utilise the system frequently.

Proper planning of the project: A clear vision and planning are among the factors that were identified by Nofal and Yusof (2015) in their conceptual framework as critical to a successful ERP implementation.

According to some researchers, top management carefully prepares the changeover process (Mahmood et al. 2019). During the planning and pre-implementation phases of an ERP system's life cycle, businesses must establish their business requirements and ERP system operations. This should be performed to ensure that the two processes indicated are as compatible as possible (Desta 2016). The conclusion of a study carried out by Saade and Nijher (2016) cited top management, a clear vision, vigorous planning, the availability of the right resources, BPR, change management, a pro-active culture, accuracy of data, training, monitoring and evaluation among the crucial critical success factors in the ERP implementation. Considering this analysis, it is important to observe that careful and thorough planning is essential in implementing these systems.

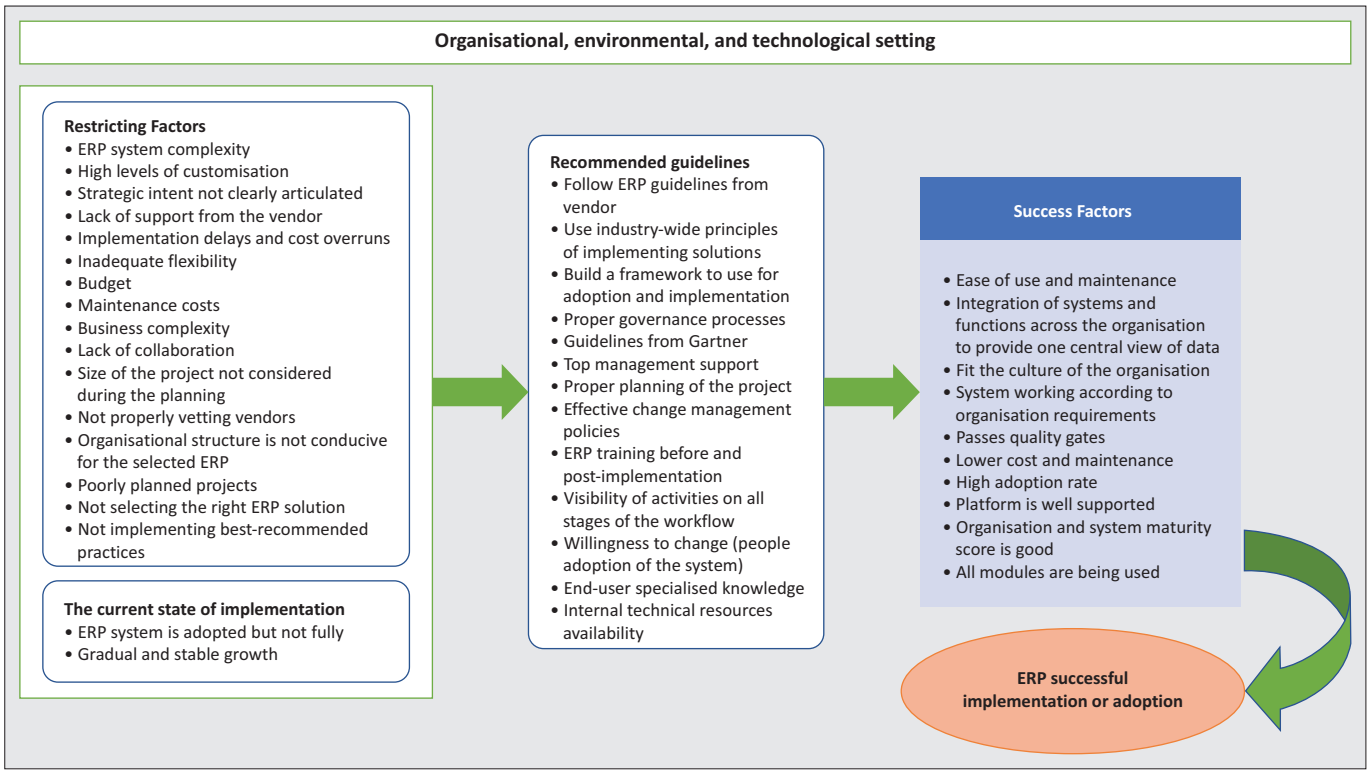
What framework or guidelines can improve the integration of a successful enterprise resource planning system in a government institution?

The following elements emerged as principles that can enable a fully integrated ERP system in a government organisation:

- Follow ERP implementation guidelines from the vendor.
- Guided by industry-wide principles of implementing solutions.
- A framework is built and adopted.
- Governance processes.
- Guidelines from Gartner.

A framework was created to explain the variables and how they connect. To construct the framework, the researcher mainly used factors that were either mentioned in the literature or the field study as critical in the successful implementation of ERP systems. Factors that affect the adoption of ERP systems were found in a mixture of organisational, environmental and technological settings. A study by Peng, Sun and Guo (2018) integrated personal, environmental and technological antecedents into their research framework. The study revealed that personal, environmental and technological factors directly interact to contribute to technology use and acceptance.

In the framework in Figure 7, factors such as top management support, proper planning of the project and ERP training before and post-implementation are among the factors that are critical for organisations to obtain benefits from investing in a sustainable ERP system. If these factors are addressed adequately, then they become critical success factors. For instance, poorly planned projects as a restricting factor can be addressed by the proper planning of projects, leading to a successful ERP implementation or adoption. Likewise, ease of use and low maintenance successfully address high maintenance costs (restricting factors). This shows a dependency relationship between the restricting factors and some success factors.



ERP, enterprise resource planning.

FIGURE 7: A framework of possible guidelines that can assist in the adoption of a sustainable enterprise resource planning system.

Building a framework through research can also assist organisations in their quest for successful ERP implementations and adoption. This can then serve as a proven guideline derived from previous research. The organisational framework must be well-structured to encourage the adoption of new technology (Baker 2012).

Strengths and limitations

Limitation

The size of the sample was limited to 30 participants with a target population of 35 to generate a confidence level percentage of 95 with an accuracy level of ± 3% (Oates 2005). The researcher only received 20 responses and therefore did not reach the accuracy level of ± 3% on the qualitative analysis. Therefore, the qualitative analysis was only used to compare phenomena and supplement the quantitative analysis.

Strength

For quantitative analysis, research can use as few as 1–2 participants (Clarke & Braun 2014). In this instance, the researcher had 20 participants to analyse, and therefore the results can be deemed accurate.

Implications or recommendations

More research could lead to a better understanding of a simple model that can help with ERP implementations in a variety of businesses and locations. This could be useful for company executives searching for a competitive advantage and researchers interested in learning more about ERP system implementation and adoption. A case study can be conducted in one or more organisations on ERP implementations and subsequent operations post-implementation. The recommended studies may focus on factors that influence which organisations decide to adopt ERP technology and which ones decide against it, the conclusion may be used to improve the approaches to non-cloud ERP systems or cloud ERP systems.

Conclusion

The findings of this study reveal that the elements that contribute to successful ERP system implementation or that prevent ERP system adoption are unaffected by the industry or the area where the organisation is located. Instead, they span several organisations and industries. There are several essential success criteria described in the literature by other scholars, as well as factors found in this study that can provide suggestions for effective adoption or implementation. Even with these elements in place, organisations are still having difficulty in implementing and maintaining a fully integrated system adoption. This study has contributed to the body of knowledge in the adoption or implementation of ERP systems in African and international organisations by providing a conceptual framework that can be used as a guideline. A framework can assist to promote a formal, consistent and well-structured approach that can be used to establish corrective measures before various issues and obstacles during ERP systems adoption and implementation.

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Competing interests

The authors have declared that no competing interest exists.

Author's contributions

T.P.S. initiated the topic, conducted a literature review, conducted the research and compiled the article. Finally, the article was submitted to K.P. for review and thereafter corrected and submitted to the journal.

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Data availability

The data obtained in this study is not available to the public but can be dispatched upon a valid request as it does not contain any information about the participants.

Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

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Appendix 1

TABLE 1-A1: Open-ended questions and response used in qualitative analysis.

Number	Question	Participant 1	Participant 2	Participant 3	Participant 4
1	Can you briefly provide a short depiction of your position in relation to ERP implementation in the organisation?	'Responsible for testing the ERP solutions.'	'Product Head, looking after BEE reporting and funding.'	'I am in charge of the Technical QA Testing of all ERP systems enterprise wise.'	'Not involved'
2	What are the factors that influenced the adoption of ERP systems in large organisations in South Africa?	'Need for integration and centrality of organisational data Need to run banking, HR, pension, payroll.'	'Cost, ease of maintenance.'	'Choosing the right ERP, as well as ensuring its security and quality assurance.'	'Governance processes. Willingness to change and adopt new ways of work.'
3	What are the kind of challenges you have come across when implementing ERP systems in the organisation?	'Programme or project planning; "inept following of the SDLC"; a lack of internal technical resources to drive implementation and a lack of communication across various implementation teams.'	'Skill to maintain and innovate on the ERP platform.'	'Timelines.PMO pushing to implement too quickly before all activities are in place Implementation of ERP modules that are not necessary.'	'Same as 2.'
4	Does the organisation follow any guidelines when adopting and implementing these ERP systems in the organisation?	'Not that I know off.'	'Yes.'	'The organisation does have guidelines on ERP implementation.'	'Unsure.'
5	What is the current state of adoption or implementation of ERP systems in the organisation?	'Quite good.'	'Very high.'	'Digitisation is taking place within the organisation. ERP adoption is rapid within the organisation.'	'Unsure.'

ERP, Enterprise resource planning.

TABLE 2-A1: Open-ended questions and response used in qualitative analysis.

Number	Question	Participant 5	Participant 6	Participant 7	Participant 8
1	Can you briefly provide a short depiction of your position in relation to ERP implementation in the organisation?	'The introduction of ERP in our organisation helped to integrate systems, and that led to improved turnaround time in service delivery.'	'Testing of the software to determine its quality.'	'Testing the ERP application to ensure that it's working according to the company's need.'	'I am a user.'
2	What are the factors that influenced the adoption of ERP systems in large organisations in South Africa?	'An efficient way of managing service delivery, be it payments, recruitment, communication etc. Centralised systems such as ERP help bring the organisation's entities into synch with one another. It is much easier to share knowledge and understanding of common goals within an organisation.'	'To have 360 degrees view of the company data from one central view.'	'The ability to merge company programs into one, making it easy to access information.'	'Size, budget.'
3	What are the kind of challenges you have come across when implementing ERP systems in the organisation?	'Integrating systems into the ERP It requires special knowledge for the users of the system. Technological expertise was an issue, and we needed to get outside expertise to get us through.'	'People adoption of the system.'	'Resistance to change.'	'Recovery testing.'
4	Does the organisation follow any guidelines when adopting and implementing these ERP systems in the organisation?	'Yes, we were guided by the basic industry-wide principles of implementing the solution.'	'Yes.'	-	'Yes.'
5	What is the current state of adoption or implementation of ERP systems in the organisation?	'Stable and gradual growth.'	'Still in the early phases.'	Yes	'Mature.'

ERP, Enterprise resource planning.

TABLE 3-A1: Open-ended questions and response used in qualitative analysis.

Number	Question	Participant 9	Participant 10	Participant 11	Participant 12
1	Can you briefly provide a short depiction of your position in relation to ERP implementation in the organisation?	I am in a quality management area, and my position is to ensure the ERP implementations have met the required requirements and passed all the quality gates to ensure successful implementation	No answer provided	No answer provided	'I do not get involved in ERP implementation as I am the user.'
2	What are the factors that influenced the adoption of ERP systems in large organisations in South Africa?	'One of the elements that may influence ERP system adoption is business complexity. Another two factors could be the structure as well as the organisation's size.'	No answer provided	No answer provided	'User involvement Employees and/or user skilling (IT skills) Top Management support.'
3	What are the kind of challenges you have come across when implementing ERP systems in the organisation?	'Customisation of the ERP systems to fit the culture of the organisation not implementing best-recommended practices.'	No answer provided	No answer provided	No Answer Provided
4	Does the organisation follow any guidelines when adopting and implementing these ERP systems in the organisation?	'Most organisations discard the guidelines when adopting and implementing the ERP systems.'	No answer provided	No answer provided	'Yes'
5	What is the current state of adoption or implementation of ERP systems in the organisation?	'In the current organisation, ERP system is adopted, and all the modules are being used.'	No answer provided	No answer provided	No answer provided

ERP, Enterprise resource planning.

TABLE 4-A1: Open-ended questions and response used in qualitative analysis.

Number	Question	Participant 13	Participant 14	Participant 15	Participant 16
1	Can you briefly provide a short depiction of your position in relation to ERP implementation in the organisation?	'I have played a technical role during the implementation of ERP, and I have used the ERP system after implementation. Currently, I use the ERP application to fulfil some management roles and for other functions with the organisation.'	'My position is testing the ERP before it can be implemented for users.'	'I was part of the initial implementation, but now I am just an interested stakeholder and the end-user of the system.'	'I am only a user of the system and, therefore, no comment.'
2	What are the factors that influenced the adoption of ERP systems in large organisations in South Africa?	'It is the prices, support, and availability skills to support the ERP system.'	'Ease of use, some ERPS are too complex for end users.'	'There is a need to streamline organisational processes and connect many technologies into a single platform where transactions can be completed end to end and all phases of the workflow can be monitored.'	'I am only a user of the system and, therefore, no comment.'
3	What are the kind of challenges you have come across when implementing ERP systems in the organisation?	'When the team faces an issue and there is a vital milestone to meet, there is a lack of immediate response from the vendor.'	'Customisation to the meet organisational needs.'	'A lack of appetite to adopt out-of-the-box standard processes. High levels of customisation. A lack of adoption because users tend to have specific preferences especially based on their previous experience at other organisations, e.g., SAP vs. Oracle. Not articulating the strategic intent of the implementation with clear expectations and matrices to evaluate success or failure. Poorly planned projects result in delay and cost overrun.'	'I am only a user of the system and, therefore, no comment.'
4	Does the organisation follow any guidelines while adopting and implementing these ERP systems in the organisation?	'They usually adhere to the recommendations and guidelines of Gartner and other reputable organisations. '	'Yes, they were following guidelines; however, with technology, there are always glitches to be expected. Organisations are different.'	'Always departs from the guidelines provided by the software supplier. A lack of adoption of standards processes and opting to customise the systems.'	'I am only a user of the system and therefore no comment.'
5	What is the current state of adoption or implementation of ERP systems in the organisation?	'The ERP system has been well accepted in the organisation, and people use it regularly.'	'The ERP system is now operational, despite the fact that it took a long time to be fully implemented and operational. Customisation and user requirements were some of the delaying factors in the implementation.'	'Low service management and asset management have now been implemented independently of the ERP system even though the modules have been licensed with the original implementation. There is a potential for core banking being implemented independently of the ERP.'	'I am only a user of the system and therefore no comment.'

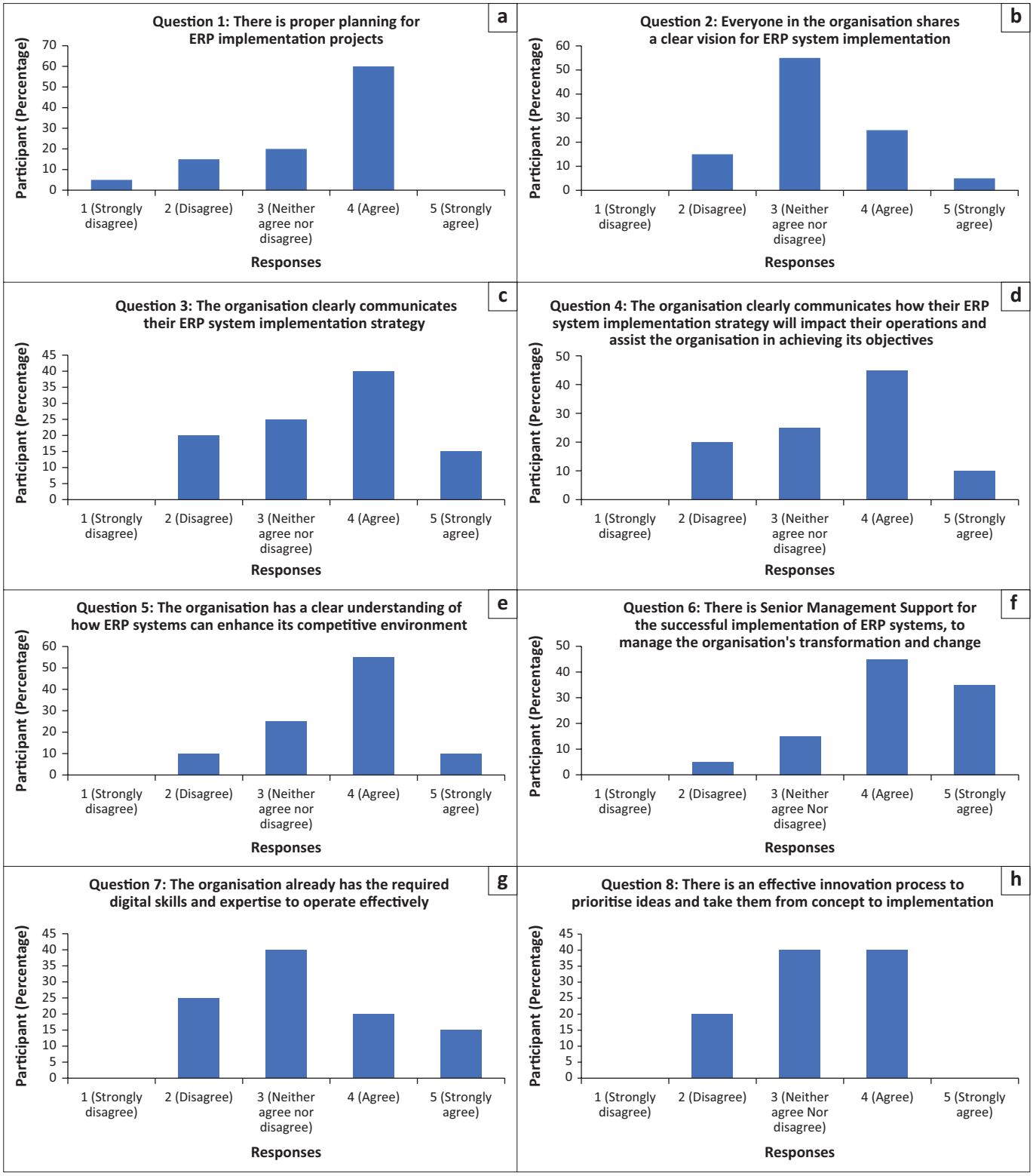
ERP, Enterprise resource planning.

TABLE 5-A1: Open-ended questions and response used in qualitative analysis.

Number	Question	Participant 17	Participant 18	Participant 19	Participant 20
1	Can you briefly provide a short depiction of your position in relation to ERP implementation in the organisation?	'I am a user of the ERP system.'	'Currently an end-user.'	'There is no resource planning tool in the PA that I am aware of. Resource planning is carried out without looking at the demand and capability of the resource.'	'I am a senior test analyst. My responsibility is to ensure that the quality of the software is exceptional and responsible for other artefacts such as the test approach, integration testing, to co-ordinate the project test activities across streams, test control and report, customer management and process implementation, to extract test requirements and create and execute test scripts (manual and automation)review and manage defects, lead reviews of test requirements and support the project manager and business operations executive as required.'
2	What are the factors that influenced the adoption of ERP systems in large organisations in South Africa?	'The organisation's culture and change management intervention'	'Ease of use, training.'	'As organisations evolve, skills are evolving and some skills become redundant. Automation or robotic is becoming the norm.'	No answer provided
3	What are the kind of challenges you have come across when implementing ERP systems in the organisation?	'Poor adoption of the system.'	No answer provided	No answer provided	'All ERP systems need to be maintained on a regular basis, which results in maintenance costs. An ERP system might appear inexpensive to start with but failing to factor in the maintenance costs attached to it before implementation can end up costing the organisation tremendous amounts to pay. This is again another reason to properly vet your vendors prior to making a decision. 'If an ERP system is not adequately flexible, the organisation may have to adjust its processes to suit the ERP for it to function. This may seem a little backward, and the time and resources it would take to reorganise the organisation and reskill the hesitant teams would not seem worth it. However, by choosing the right software for the organisation's specific requirements, integration would be seamless and thereby eliminate the lack of flexibility'
4	Does the organisation follow any guidelines when adopting and implementing these ERP systems in the organisation?	'Yes, correct'	'Not sure'	'I strongly suggest that a framework be built and adopted by organisations for ERP planning.'	No answer provided
5	What is the current state of adoption or implementation of ERP systems in the organisation?	'I think we have a high adoption rate at the moment as the platform is supported well.'	'We have Oracle, which looks like it needs enhancing because of features that are not adequate.'	'Non-existent at the present moment as far as I am aware.'	'I am not sure at all.'

ERP, Enterprise resource planning.

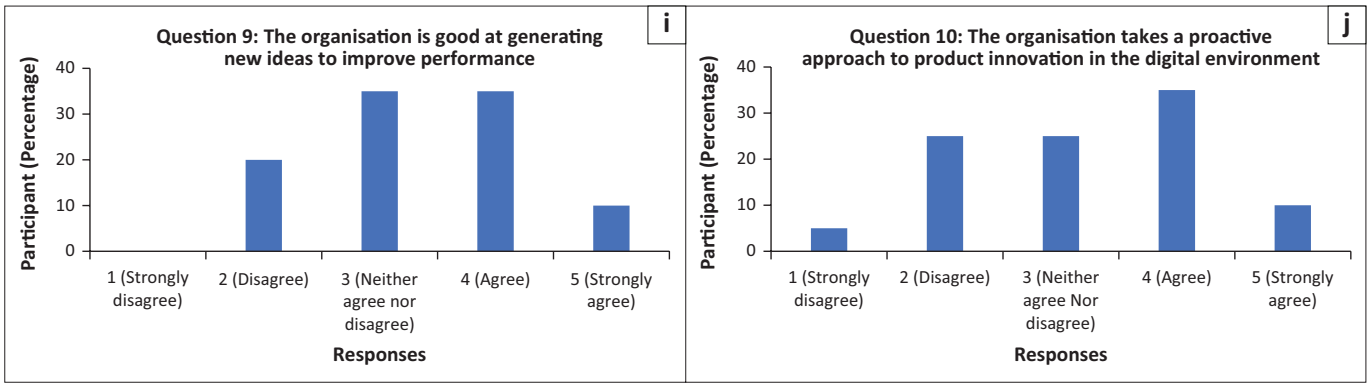
Appendix 2



ERP, Enterprise resource planning.

FIGURE 1-A2: Organisational setting questions, responses and analysis.

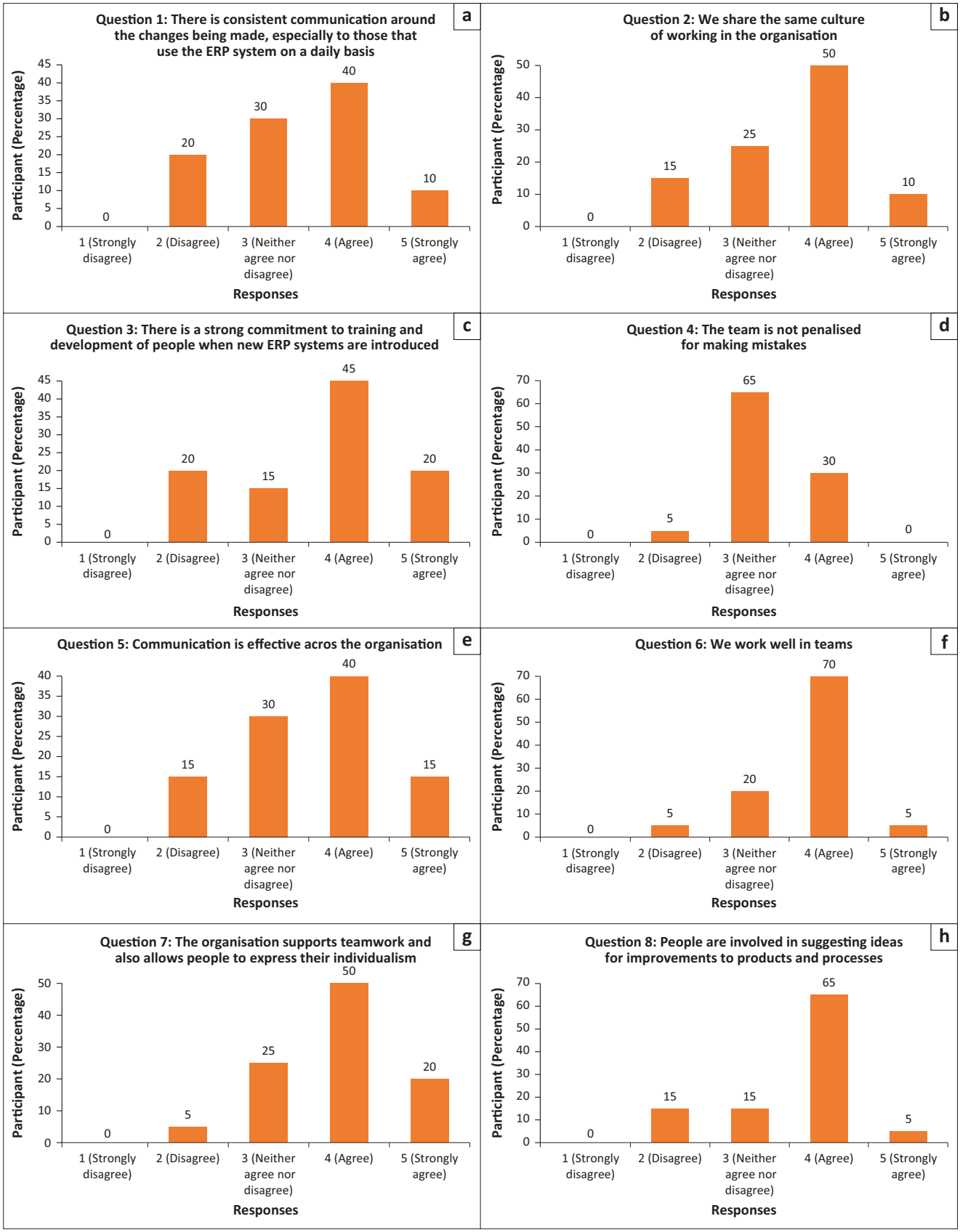
Figure 1-A2 continues on the next page →



ERP, Enterprise resource planning.

FIGURE 1-A2 (Continues...): Organisational setting questions, responses and analysis.

Appendix 3



ERP, Enterprise resource planning.

FIGURE 1-A3: Environmental setting questions, responses and analysis.

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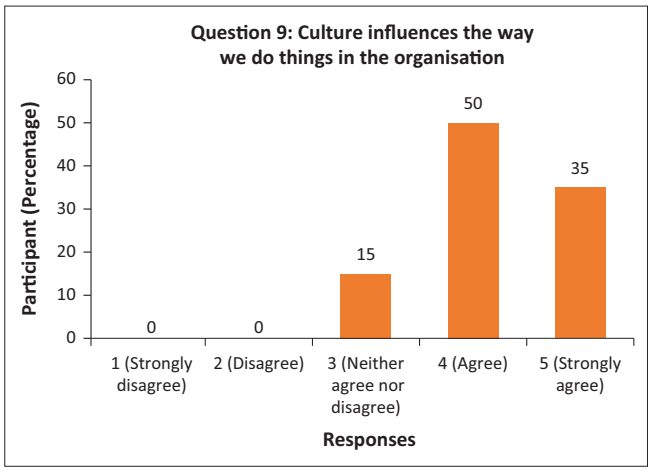

ERP, Enterprise resource planning.

FIGURE 1-A3 (Continues...): Environmental setting questions, responses and analysis.

Appendix 4

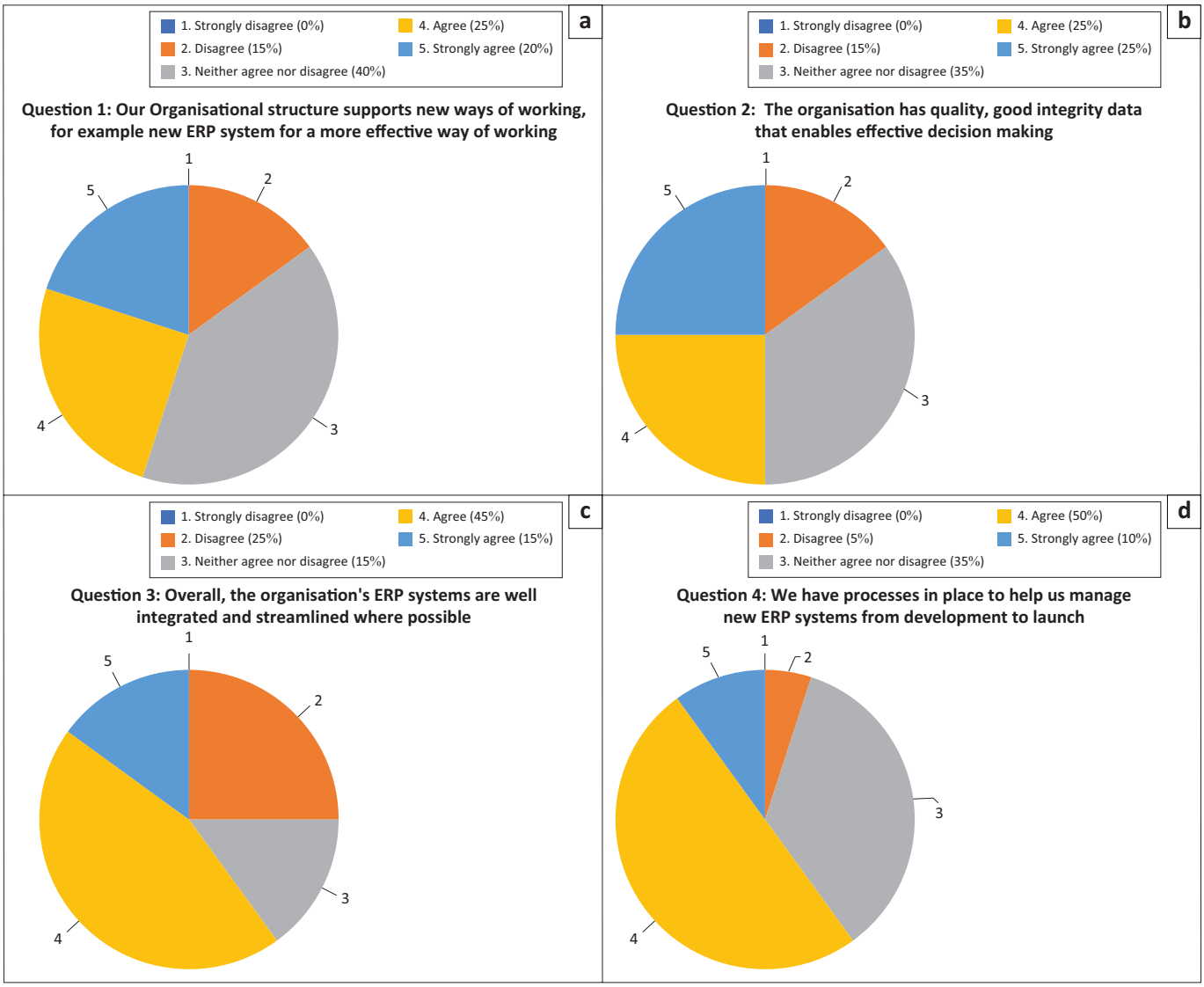

FIGURE 1-A4: Technological setting questions, responses and analysis.

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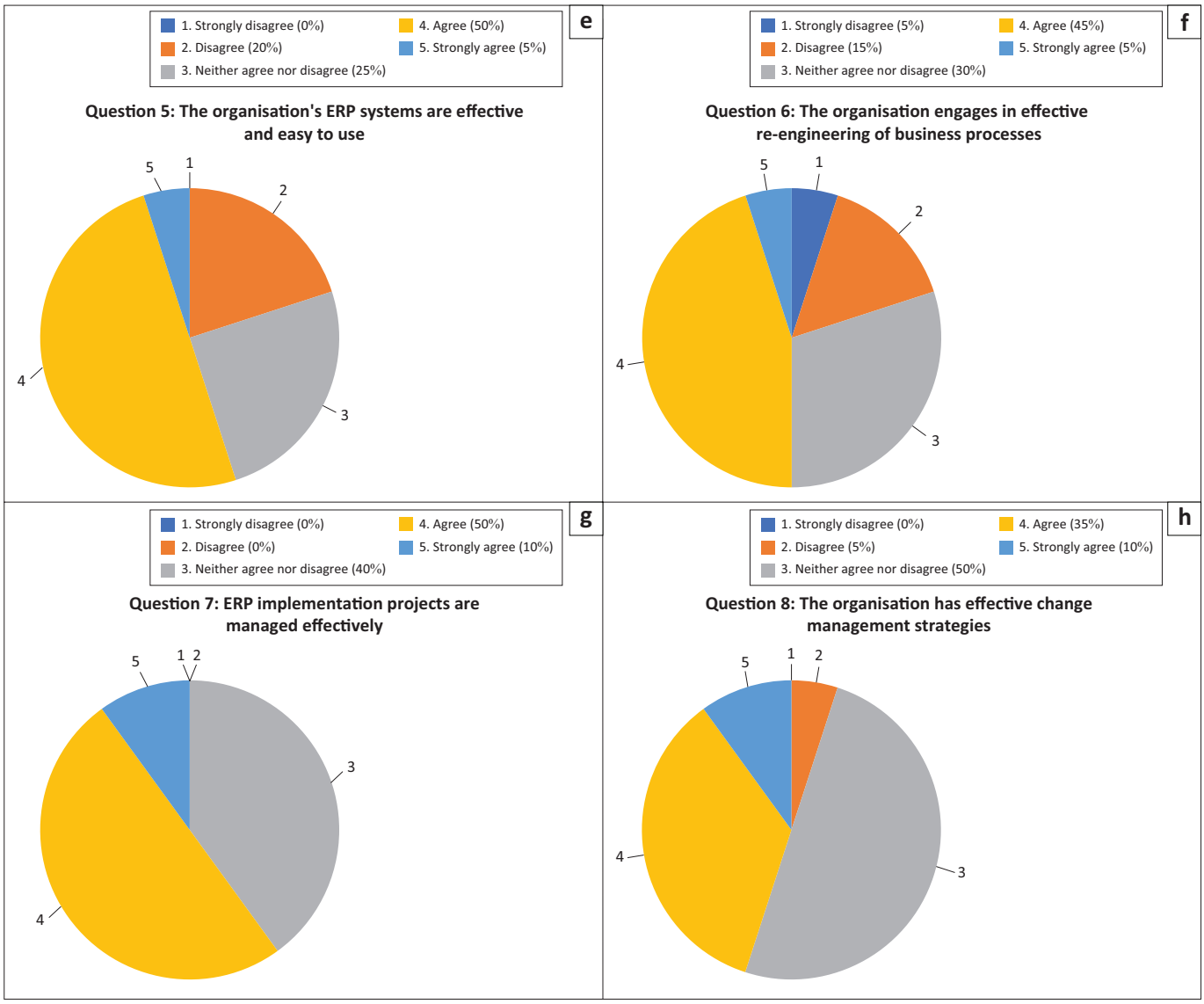

FIGURE 1-A4 (Continues...): Technological setting questions, responses and analysis.

Appendix 5

FIGURE 1-A5: Atlas.ti word cruncher of the responses from participants.